A 2020 Vision for Food, Agriculture, and the Environment

Global food security: implications for Australia

Record of a seminar conducted by the Crawford Fund for International Agricultural Research, Parliament House, Canberra, 28 May 1996

Editor: Julie Haldane

Australian Centre for International Agricultural Research (ACIAR)

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Contents

Preface

Our purpose today is to consider changes and developments that are likely to occur throughout the world during the next 25 years, i.e. by the year 2020, and to discuss their implications for Australia. We are, of course, concentrating on those changes concerned with food, agriculture and the environment — the very bases of human life.

We are trying, as best we can, to see into the future. This is always difficult and risky and such attempts often end up with a distorted picture of either doomsday or utopia.

Whatever our vision, we can all see that the human race is today faced with problems the like of which have never been faced before. The growth and size of the populations and the growing magnitude of global poverty, hunger and environmental degradation together ensure a difficult and challenging future for our children and grandchildren.

In our attempts to see more clearly what, in fact, the future holds we are extremely fortunate today to have the help of some of the best telescopes in the business.

For some 20 years the staff of the International Food Policy Research Institute in Washington has been collecting and analysing data from every corner of the globe. A few years ago they recruited a wide range of individuals, non-government organisations, private institutions and public agencies from developed and developing countries to put together all the available information (scientific, economic, social and environmental) to construct region by region as accurate a vision as possible for the next 25 years.

Of course, their vision is not a picture painted in hard and fast colours — it includes many shades of grey — but because it is a vision free of emotional and political prejudice, it can fairly be described as the most reliable lens that is available to us for peering into the future.

The 2020 Vision Project was the brainchild of Dr Per Pinstrup-Andersen, the Danish economist who is the Director-General of the International Food Policy Research Institute. Dr Pinstrup-Andersenís career has included senior positions as a research economist at Cornell University, the International Centre for Tropical Agriculture in Colombia, the International Fertilizer Development Center in the USA and many years at his institute in Washington, of which incidentally our own Sir John Crawford was the first Chairman of the Board.

Almost exactly a year ago Dr Pinstrup-Andersen led a formidable team of world experts in presenting their 2020 Vision to a large international conference in Washington. Since then satellite seminars have been held in many countries.

It is a privilege for the Crawford Fund to host todayís seminar in Canberra. The fund is especially grateful to the following co-sponsors:

Australian Academy of Technological Sciences and Engineering

AusAID

Australian Centre for International Agricultural Research

Commonwealth Department of Foreign Affairs and Trade

Commonwealth Department of Primary Industries and Energy.

DR PER PINSTRUP-ANDERSEN joined International Food Policy Research Institute (IFPRI) as its Director-General in 1992. Prior to this, he was director of the Cornell Food and Nutrition Policy Program, Professor of Food Economics at Cornell University, and a member of the Technical Advisory Committee to the Consultative Group on International Agricultural Research. Pinstrup-Andersen also served as a research fellow and director of the Food Consumption and Nutrition Policy Program at IFPRI, an agricultural economist at the International Centre for Tropical Agriculture in Colombia, and director of the Agro-Economic Division at the International Fertiliser Development Centre in the USA.

The Challenge of Sustainable Human Development

PER PINSTRUP-ANDERSEN
DIRECTOR-GENERAL, INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

Policymakers around the world, including Australia, are confronted daily by challenges related to political and ethnic instabilities, poverty and economic inequalities, rapid population growth and movement, and environmental degradation. Underlying these important challenges, however, is a much more fundamental challenge, and that is the challenge of sustainable human development. The challenge is to ensure that every person has access to sufficient food, safe water, primary education, primary health care, remunerative employment, and productive assets — the building blocks of sustainable human development.

If we fail to meet this fundamental challenge, we will not meet any of the other challenges. Why? Because these political, economic, social, and environmental challenges are inherent to the basic condition of human beings, and the basic condition of human beings is our access to income, food, water, health care, and education. Poor, hungry, ill, and illiterate people, who are marginalised in economic processes and disenfranchised in political processes, are desperate people. Widespread food insecurity, unhealthy living conditions and abject poverty in developing countries today is already threatening global stability. Failure to achieve sustainable human development and doing business as usual toward developing countries will foster the very conditions that will further destabilise and polarise the world in the years to come, with tremendous consequences for all people. Do not for a moment think that Australia will remain unaffected by events and conditions elsewhere in the world; the world is drawing closer every day, whether we like it or not.

In this presentation, I would like to accomplish three things: to delineate the dimensions of the challenge that lies ahead; to present a vision of a world with sustainable human development; and to propose a set of actions to achieve sustainable human development.

...we have the capacity and the resources to achieve sustainable human development.

My central message is that we have the capacity and the resources to achieve sustainable human development. Governments and civil societies in both developing and developed countries must develop the necessary political will and commitment to action. We cannot afford to wait much longer to take the necessary action; we are already on borrowed time.

Dimensions of the Challenge

To understand the dimensions of the challenge that lies ahead, I will briefly review the current situation and likely future trends in poverty, food insecurity, child malnutrition, and access to water, education, and health care.

Poverty is significant and persistent in many developing countries. Over 1.1 billion people live in absolute poverty, with incomes equivalent to a dollar a day or less per person. Every second person in South Asia and Sub-Saharan Africa, and every third person in the Middle East and North Africa, is absolutely poor. Unless concerted action is taken now, it is clear that poverty will remain entrenched in South Asia and Latin America, and will increase markedly in Sub-Saharan Africa.

About 800 million people — one out of every six persons in developing countries — are food-insecure (Figure 1). They do not have access to the food they need for healthy and productive lives. Their numbers have declined by 150 million from 950 million in 1970, primarily because of a 50 per cent reduction in the number of food-insecure people in East Asia. However, Sub-Saharan Africa

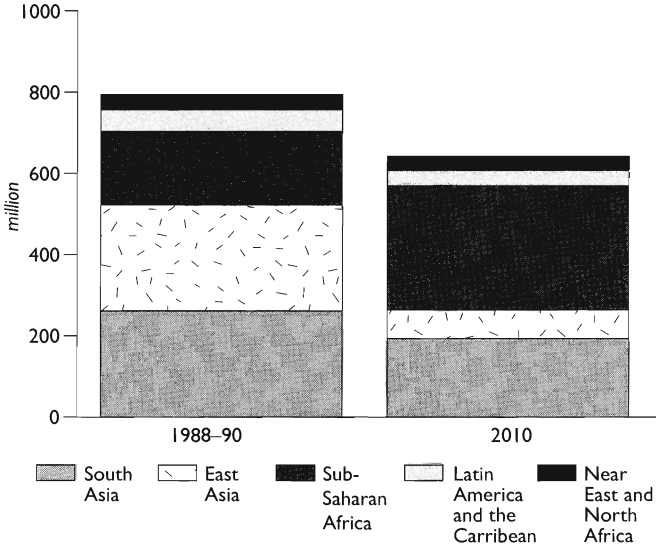

Figure 1. Number of food-insecure people, 1988–90 and 2010

Source: N. Alexandratos, ed. *World Agriculture: Towards 2010.* Rome, Italy: Food and Agriculture Organization of the United Nations, 1995.

has emerged as a major locus of hunger, with a 50 per cent increase in the number of food-insecure people in the past 25 years to 175 million. Projections by the United Nations Food and Agriculture Organization suggest that the number of food-insecure people could decline by another 150 million to 650 million in 2010, with the largest decline in East Asia followed by South Asia. However, in Sub-Saharan Africa, the number of food-insecure people is projected to increase by 70 per cent to about 300 million in 2010.

One-third of all preschool children in developing countries — 185 million children — are malnourished. They are seriously underweight for their age. About 40 000 children die every day of diseases related to malnutrition. IFPRI research suggests that with business as usual, the number of malnourished children could decline by about 30 million to 156 million by 2020. As with food insecurity, large decreases in child malnutrition are likely in East and South Asia, but in Sub-Saharan Africa the number of malnourished children could increase by 50 per cent to more than 40 million in 2020. However, we must not be content with business as usual. If we increase investments in agricultural research and in public goods such as health and education, the number of malnourished children could decline to 109 million in 2020 — about 50 million less than in the most likely scenario (Figure 2). Alternatively, if we cut back on such investments from the already low levels of the early 1990s, the number of malnourished children could increase to 205 million in 2020 — about 50 million more than in the most likely scenario.

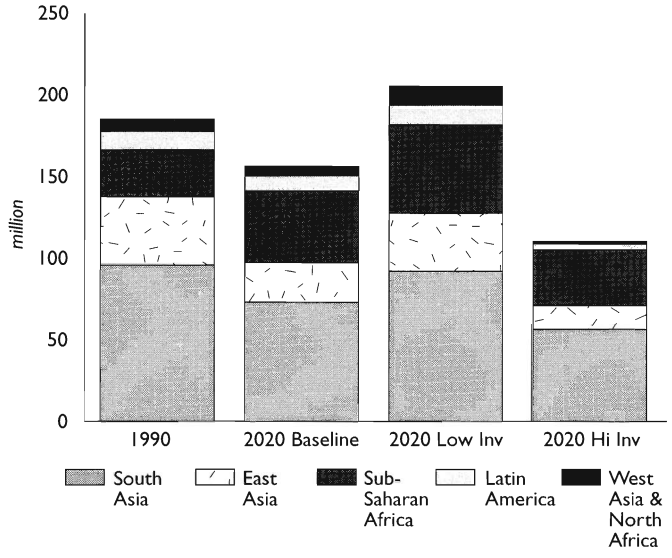

Figure 2. Number of malnourished children in developoing regions, 1990 and 2020

Source: M.W. Rosegrant, M.W., N. Agcaoili-Sombilla, and N.D.Perez. *Global Food Projections to 2020: Implications for Investment.* 2020 Discussion Paper, 5. Washington, DC: International Food Policy Research Institute, 1995.

Diseases of hunger and malnutrition are widespread. For instance, vitamin A deficiency causes perhaps 250 000–500 000 children to go blind each year, and two-thirds of them will die. Iron deficiency has led to anaemia in more than 40 per cent of the women of reproductive age in developing countries.

It is of critical importance that we accelerate investment in rural areas to avoid excessively high rates of rural-to-urban migration.

Moving on to the other components of sustainable human development, about 1.3 billion people, primarily in the rural areas of developing countries, do not have access to safe water. Almost 2 billion people do not have access to adequate sanitation systems. One-third of the adult population of developing countries is illiterate. High illiteracy rates are not surprising given that a third of the primary school students drop out by Grade 4. Although as many girls enrol in primary school as boys, they complete only about half as many years of schooling, leading to higher illiteracy rates among females than males. About 1 billion people in developing countries lack access to health services; not surprisingly, infant mortality rates are 10 times higher than in developed countries.

The challenge of achieving sustainable human development is compounded by expected population growth and by environmental degradation. In the next quarter-century, world population is expected to increase by 40 per cent — that is, by 90 million people every year — the largest population increase in human history. More than 90 per cent of the population increase is expected to occur in Asia, Africa, and Latin America, primarily in the cities. Rapid urbanisation could more than double the urban population of developing countries to 3.6 billion in 2020, by which time urban dwellers could outnumber rural dwellers. It is of critical importance that we accelerate investment in rural areas to avoid excessively high rates of rural-to-urban migration. We still have a window of opportunity to solve poverty and nutrition problems in the rural areas before they become urban problems, but that window is gradually closing. We must resist the temptation and emerging pressures to shift resources from rural to urban areas in anticipation of rapid urbanisation, because that will exacerbate the rural problems that lead to excessive urbanisation in the first place.

I completely agree with the World Bank President and Australian farmer, Mr Wolfensohn, when he recently said and I quote, 'We must give the highest priority to the agricultural and rural sectors since their neglect means that neither rural nor urban poverty can be reduced'.

...significant expansion of agricultural land would entail very high environmental costs in most of the world.

In order for current and future populations to be fed adequately, more food will need to be grown on existing land as significant expansion of agricultural land would entail very high environmental costs in most of the world. However, 30 per cent of

Africa's agricultural land, pastures, forests, and woodlands are degraded, as are 27 per cent of Asia's and 18 per cent of Latin America's. Crop productivity losses from land degradation are significant and widespread.

A Vision for Sustainable Human Development

By now, it may begin to seem as if the challenge of sustainable human development is unsurmountable! It is not. We have the capacity and the resources to create the conditions to foster sustainable human development. IFPRI has developed a vision for feeding the world, preventing poverty, and protecting the earth by the year 2020, the building blocks for sustainable human development. This vision, which we call the *2020 Vision*, is of a world where every person has access to sufficient food to sustain a healthy and productive life, where malnutrition is absent, and where food originates from efficient, effective, and low-cost food systems that are compatible with sustainable use of natural resources.

Action Program

We have identified six priority areas where action is urgently needed to achieve sustainable human development. These are:

- strengthening the capacity of developing-country governments;
- investing more in poor people;
- accelerating agricultural productivity;
- assuring sound management of natural resources;
- developing competitive markets; and
- expanding and realigning international development assistance.

Firstly, we must selectively strengthen the capacity of developing-country governments to perform appropriate functions, such as maintaining law and order, establishing and enforcing property rights, promoting private-sector competition in markets, and maintaining appropriate macroeconomic environments. Predictability, transparency and continuity in policymaking and enforcement must be assured. The efforts of the past decade to weaken developing-country governments must be turned around. More effective local and national governments are essential for the other partners, such as individuals, households, communities, non-governmental organisations and the private sector, to successfully undertake activities to achieve sustainable human development. Governments must also be helped to relinquish those functions better performed by others.

Secondly, we must enhance the productivity, health, and nutrition of poor people and increase their access to remunerative employment and productive assets. We can do this by providing access to primary education for all children, with immediate emphasis on female and rural children; by providing access to primary health care, including reproductive health services, for all people; by providing access to clean water and sanitation for all people; by strengthening and enforcing legislation to empower women; and by providing access to productive resources and remunerative employment.

For each dollar generated in agriculture, another dollar and a half is generated in other areas of the economy.

Thirdly, we must accelerate agricultural productivity. Agriculture is the lifeblood of the economy in most developing countries. In the lowest-income countries, it provides up to three-quarters of all employment and half of all incomes. IFPRI research shows very strong links between increases in agricultural productivity and broad-based economic growth in the rest of the economy. For each dollar generated in agriculture, another dollar and a half is generated in other areas of the economy. Agriculture has long been neglected in many developing countries, resulting in stagnant economies and widespread hunger and poverty. Let us recognise and exploit the key role of the agricultural sector in meeting food needs and thereby reducing hunger and malnutrition, and in fostering broad-based economic growth and development, thereby raising incomes and generating employment. Productivity increases among small farmers are essential to make this happen. Agricultural research systems must be mobilised to develop improved agricultural technologies and techniques, and extension systems must be strengthened to disseminate technologies and techniques. Low-income developing countries invest less than 0.5 per cent of the value of their agricultural output in agricultural research, compared to a little less than 2 per cent in middle-income developing countries and more than 2 per cent in high-income countries. Australia invests about 3.5 per cent of its agricultural output to agricultural research. Developing countries must increase their national agricultural research expenditures in the near term to 1 per cent of the value of agricultural output with a longer term target of 2 per cent. Agriculture is the engine of growth in most developing countries; let us start the motor and keep it going.

Fourthly, we must ensure sound management of natural resources. The agriculture sector also has a key role to play here. A large share of the world's poor and food-insecure people live in less-favoured agricultural lands, which are often degraded and deforested. Their poverty may force them to engage in resource-degrading activities, such as mining soils or cutting down forests. They do not own the resources, or have secure access to them, so

they have little incentive to conserve soil, groundwater, or trees. Until now, we have tended to focus on the more favoured areas. This balance must be redressed if we are serious about sustainable human development for all people. Investments are required in infrastructure, market development, natural resource conservation, agricultural research, primary education and health care for those regions.

The poor do not own the resources, or have secure access to them, so they have little incentive to conserve soil, groundwater, or trees.

Fifthly, we must develop efficient, effective, and low-cost markets. Inefficient state-run firms must be phased out, policies and institutions that favour large-scale capital-intensive market agents over small-scale labour-intensive ones must be removed, market infrastructure must be developed and maintained, and small-scale credit and savings institutions must be facilitated. Many developing countries are privatising their input and output markets, replacing inefficient, poorly functioning state marketing companies and excessive, inappropriate government regulations with private-sector marketing agents. It is essential that this process results in competitive markets. A shift from public to private monopolies may not be helpful.

Sixthly, we must expand and realign international development assistance. Many years ago, industrialised countries agreed to allocate at least 0.7 per cent of GNP (gross national product) to foreign assistance. Most countries have not reached this target. The OECD (Organisation for Economic Cooperation and Development) countries as a whole have reduced their foreign assistance in the last few years, and their average contribution is now about 0.3 per cent of GNP. At 0.35 per cent, Australia provides a slightly higher share than the OECD average.

...what counts most in the end is not merely the amount of money that is allocated to the overseas aid program, but how that money is spent.

I appreciate the difficulties of a new government which is tackling a budgetary deficit of $8 billion, but I urge Australia to at least maintain its present level of overseas aid, and to increase it as soon as it finds it possible to do so. However, what counts most in the end is not merely the amount of money that is allocated to the overseas aid program, but how that money is spent. I believe that current considerations by AusAID to increase the emphasis on aid to agriculture and rural development is a critical step in the right direction.

The effectiveness of overseas aid would also be improved if it gave a renewed emphasis to those low-income countries where food insecurity, poverty, and the degradation of natural resources are greatest. In the Asian and South Pacific Region, Australia could provide much-needed leadership in pursuing the six priority areas of our 2020 Vision.

Sustainable human development ensures international stability. Struggle by poor people in developing countries for access to food,

Sustainable human development ensures international stability.

water, education, and health — the building blocks of sustainable human development — in the context of scarce resources and limited or stagnant economic growth is putting pressure on the rest of the world to intervene at enormous expense and loss of life. They are also leading to massive flows of refugees and displaced persons, desperately seeking survival and better living conditions in other lands. Investment in human development will mitigate pressures on borders and the need for crisis interventions and escalating relief expenditures in the years to come.

It is also in the industrialised countries' economic interest to invest in international development, because it leads to creation of export markets. As poorer people get richer, they become better customers for industrialised countries' products. The experience of Asian countries such as Indonesia, Malaysia, Taiwan, and Thailand vividly demonstrates this. Today, these economies provide enormous new export opportunities for industrialised countries like Australia.

International development assistance should not be seen as a hand-out. It can be an investment in sustainable human development that benefits people in both developing and industrialised countries.

THE HON. ALEXANDER DOWNER is the Minister for Foreign Affairs in the Australian Parliament. From 1995 to 1996 he was Shadow Minister for Foreign Affairs and prior to that, Leader of the Opposition. He held various positions in the Shadow Ministry including Treasury, Defence, Trade and Trade Negotiations.

The Challenges for Sustainable Human Development: a Reponse from Australia

Alexander Downer
Minister for Foreign Affairs, Australia

On behalf of the Australian Government, I am very pleased to welcome members of the Crawford Fund and your colleagues from the International Food Policy Research Institute in Washington to Canberra this week.

The 2020 Vision in the Context of World Poverty

I congratulate the Crawford Fund and all those national and international institutions, agencies and non-government organisations (NGOs) who worked with IFPRI in developing the Vision. I am particularly pleased to acknowledge the role of two distinguished Australians, Philip Flood, currently the Secretary of my Department and George Rothschild, Director-General of the International Rice Research Institute, who were members of the project's International Advisory Committee.

The issues of global food production and access are particularly challenging. On the one hand, more people in the world are now well-fed and enjoy a reasonable standard of living than at any previous time in history. Yet on the other hand, as the world's population continues to grow, more people than ever before go to bed hungry, suffer appalling poverty and seriously damage their environments in a desperate bid for survival.

Too often the various issues that contribute to the impoverishment of so many of the world's population are considered in isolation. In identifying priority areas for action, IFPRI's vision articulates and encapsulates extremely well the factors that entrench poverty. The vision gives the international community a way to chart its development programs in an integrated fashion.

The Direction of Australian Aid

Dr Pinstrup-Andersen has pointed out very clearly that the challenge of sustainable development cannot be ignored. Global

security cannot be assured while so many people live below the poverty line. The Australian Government understands this, and I am pleased to say that the priorities outlined in IFPRI's 2020 Vision and our own coincide to a remarkable extent.

A Review of the Australian Aid Program

The world of the 1990s is a very different one to that of the preceding decades. To make sure that Australia's aid program reflects the needs of today and is properly positioned to face the challenges of the next century, I am commissioning an independent review of the aid program.

This review was foreshadowed in the Coalition's foreign policy document *A confident Australia,* and will be the most comprehensive review of the entire aid program since the Jackson Report of 1984.

The review will examine how the aid program can best contribute to lasting poverty reduction, while also serving Australia's interests.

Its purpose will be to present a report to me as the Minister for Foreign Affairs on the overall priorities, objectives and focus of the aid program. The review will examine how the aid program can best contribute to lasting poverty reduction, while also serving Australia's interests.

I have been concerned for some time that Australia's aid program needs to refocus on its fundamental purposes, namely to assist developing countries to help meet the basic needs of their people and to assist in achieving a more secure and equitable international order.

The features to be emphasised in this aid review will reflect the principles set out in *A confident Australia* which are:

- recognition that the primary purpose of foreign aid is assistance in overcoming humanitarian concerns through permanent outcomes;
- an increase in the proportion of aid allocated to humanitarian and poverty reduction purposes;
- support for an increased role of non-government organisations, both Australian and local, in the delivery of Australia's foreign aid;
- significant increase in support for rural development;
- significant increase in focus on assistance projects directed to the needs and abilities of women and girls;
- institutional support for States in the process of developing democratic structures; and
- preference for the conduct of Australian aid activities overseas using Australian goods and services and personnel rather than contracting out to organisations from other developed countries.

I am also concerned that Australia's aid program needs to be run on a systematic and coordinated basis, not merely driven by representations from particular groups.

Aid is not a subsidy to business nor a mere extension of foreign policy objectives. It is not diplomacy by other means. The principal objectives of Australia's aid program should be to ensure the reduction of poverty and the promotion of economic development as a permanent means of overcoming such poverty.

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The review will need to take into account current international trends which are influencing the nature of development cooperation. It will pay close attention to overall government directions to ensure coherence between aid and foreign trade and domestic policies.

The aid review will examine how the aid program should respond to economic globalisation and the opportunities and challenges this provides for developing countries, as well as the instabilities generated by the post-cold war period.

Australia needs to clarify the role of the aid program in addressing global issues such as environmental degradation and climate change, refugees and the spread of preventable diseases.

Australia's aid program will continue to focus on the Asia–Pacific region, in particular within the South Pacific and poorer countries of the East Asian region. The review will assess Australia's aid priorities within this region. Australia's future aid relationship with Papua New Guinea and the South Pacific Island States will be addressed.

I will also ask the review to consider the scope for Australian assistance outside the Asia–Pacific region, in particular Africa and the Central Asian Republics.

The review should examine the appropriate program focus, including the balance between sectors — such as education and health, infrastructure and good governance. I expect the review will consider good governance and policy dialogue, including economic reform, human rights and other equity concerns.

Importantly, the review will consider the appropriate ways of achieving these outcomes. There are occasions when an international approach is far more effective than Australia providing aid on its own to projects in other countries. At other times, community development organisations will be able to make the strongest contribution.

Composition of the Review Team

The review will be conducted by a three-person committee. The chairman of the committee will be Mr Paul Simons, former Executive Chairman of Woolworths. Mr Simons has had a distinguished career in business, taking Woolworths to record profits

through firm and visionary leadership. He will be assisted by two other eminent Australians with relevant expertise.

He will be joined by Professor Cliff Walsh from the University of Adelaide. Professor Walsh heads the South Australian Centre of Economic Studies. He has a wealth of experience in academia and in the provision of high quality economic advice to government.

Completing the team is Ms Gaye Hart, currently the director of the Hunter Institute of Technology. Ms Hart brings a strong interest in development issues to the review. She served as the Executive Director of UNICEF Australia and was a member of the Executive Committee of the Australian Council for Overseas Aid (ACFOA).

Involving the Community

The review will also undertake to develop a renewed interest in aid in the Australian community. While this Government remains committed to the eventual target of 0.7 per cent of GNP, as budgetary circumstances permit, I am concerned that the donations raised by the non-government sector remain substantially below the comparable rates of other countries. According to the Industry Commission, donations from the Australian community to their overseas relief and development agencies amounted to only $173 million in 1993–94. Indeed, aid provided overseas by Australian community development organisations was well below their OECD counterparts.

I acknowledge that Australia's non-government organisations working overseas are competing with 11 000 charities who provide services within Australia. Even so, I am particularly keen that development NGOs build a long-term viable future.

I have already told ACFOA that I would be happy to support any proposals it may have for developing stronger links with the business community. I have offered to chair a meeting at which much greater cooperation between non-government organisations and Australia's business community could be forged.

Micro-enterprise Development

A review is an ideal occasion for innovative thinking about aid and for looking for creative projects which will benefit those in desperate need.

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Last month while visiting Thailand, I saw the excellent work being done in the slum areas of Bangkok in a micro-enterprise project. The Bangkok Micro-enterprise Development Project helps very poor people by creating jobs — some 11 000 so far, through the provision of small loans. Through tiny amounts of money,

families are helped to undertake their own income-producing activities. This simple and ingenious scheme works wonderfully well. The lenders get their money back — small borrowers are demonstrably conscientious about repaying their loans — and the businesses are very much part of the sustainable development economy. As many of you will know, micro-finance schemes have also provided a spur to rural development particularly by harnessing the productive skills of women.

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Australian Support for International Agricultural Research

One key element of Australia's aid program will be robust support for agricultural development and reform. I agree that agriculture is of fundamental importance to developing countries' economies. IFPRI's research has demonstrated that improving farm productivity and incomes is crucial to economic advancement in these countries. Australians above all know how vital agricultural research has been and still is.

Australians above all know how vital agricultural research has been and still is.

Australians have had to learn how to use precious natural resources in a sustainable way. In doing so, we have accumulated internationally recognised expertise in areas such as dry climate farming and water catchment management. Through development cooperation activities, Australia hopes to pass on this expertise so that others may benefit from our experiences, and perhaps even avoid some of our mistakes. It is one of the areas where Australian aid can have its biggest impact.

Within my portfolio, the Australian Centre for International Agricultural Research plays an important part in promoting research into sustainable agricultural production and natural resource management in developing countries. It has nurtured international links through this work and Australian scientists continue to be prominent on the world stage.

A Broad Approach to Poverty Alleviation

Important as agricultural research is to the continuing battle against endemic poverty, other factors play a key role. As I stated at the beginning of my address, the value of such a concept as the *2020 Vision*, is its ability to encapsulate a multitude of factors that contribute to the plight of the estimated 800 million who face the constant threat of hunger.

As Dr Pinstrup-Andersen has explained, the factors necessary for the alleviation of poverty are many. These include good and accountable government, adequate physical and social infrastructure and opportunities for all to participate actively in the

economic life of the nation and the region and indeed at the global level.

This demands responses which attack poverty on a range of fronts. Australia needs to look at measures that provide the basis for long-term development. This will be achieved only if a country creates the conditions for sustained and equitable economic growth. Ultimately, that will involve policy choices which must be made by each sovereign nation. However, aid can assist countries to develop the capacity to make good policy and help in its implementation.

The Links between Trade Liberalisation and Development

There are enormous gains to be made from the trade opportunities made possible by the successful conclusion of the Uruguay Round.

The phenomenon of globalisation means that no country can insulate itself from the world market. There are enormous gains to be made from the trade opportunities made possible by the successful conclusion of the Uruguay Round. However, it is clear that the path to full trade liberalisation is not an easy one.

The developed world has the responsibility to assist developing countries make the transition by helping them learn the rules of the new trading game and ensure they are able to reap its benefits.

Likewise, as a prosperous agricultural exporter, Australia has an obligation to help in order to cushion those who are vulnerable in the period of adjustment. Australia is also meeting this obligation through its annual 300 000 tonne commitment of grain under the Food Aid Convention.

Australia is providing technical advice to a number of governments which are in the process of liberalising their economies. We are also paying attention to the important requirement of fostering private enterprise in these transitional economies.

Conclusion

I have no doubt that everyone associated with this conference is already well aware that the people of the world face many seemingly insoluble problems. Through our aid program, and through the efforts of the Australian community — non-government, business and professional — Australia does improve the lives of the poor. That is why this aid review which I have announced today is so important.

Like all Australians I am distressed that so many children and mothers in countries as close as Papua New Guinea and Solomon Islands still die needlessly from basic preventable diseases such as measles, diarrhoea and malaria. The Government wants to examine how it can best mobilise Australian expertise to provide immunisation, clean water and the research to combat these diseases.

Children as young as 5 years of age are working long hours in appalling conditions as child labourers. I want the Simon Report to reflect on Australia's aid program so that it can help to provide these children with opportunities to escape servitude and have a chance at some kind of life. Australia is well capable of such efforts, not only with children who are forced to work to survive.

Through carefully targeted aid, an Australian-funded program in a province of Laos cut infant mortality by 80 per cent in two years. It achieved this remarkable result by training traditional birth attendants in each village in the skills of midwifery and diagnosis of complicated labours.

Diseases such as HIV/AIDS call for concerted international responses based upon agreed strategies. It is a tragedy that 8 per cent of people in Zambia and 10 per cent of Zimbabweans are infected with HIV. It would be an even worse tragedy if Australians did not do anything to help.

These are the types of practical humanitarian-based aid which the Government wants to see develop further.

Solving poverty and providing relief to people living in misery is an immense task. I believe Australia has the capacity, the expertise, and the will to make a difference. Providing aid within a policy framework is important. There are no incontrovertible truths and what was once axiomatic in the 1960s is not the case in the 1990s. The accepted wisdom which governs aid programs today will be under challenge in the year 2020. Australia needs to challenge old and current orthodoxies and to search for practical solutions.

Australia needs to challenge old and current orthodoxies and to search for practical solutions.

I am confident the aid review will provide this. Aid in Australia needs new visions. IFPRI provides just one such vision for the future. Its vision and those of other interested and committed groups will be welcomed at this review.

In organising today's seminar, Derek Tribe and his team from the Crawford Fund have presented us with a valuable opportunity to explore key issues with the architects of the *2020 Vision.*

Dr Mark W. Rosegrant worked as a policy analyst with the Ministry of Agriculture of the Philippines until he joined IFPRI as a research fellow in 1980. While in the Philippines, he was also a visiting lecturer at the University of Philippines. His current research interests include: global food supply, demand and trade; water resource allocation policy; irrigation investment policy; sources of agricultural productivity growth; agricultural pricing policies, and government investment behaviour.

Global Food Supply and Demand: the Impact on People, Politics and Prices

MARK ROSEGRANT
RESEARCH FELLOW, INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

For the first time since the global food crisis of 1974, world cereals prices have increased dramatically in the past year. Wheat and maize prices in early 1996 are 50 per cent higher than prices a year ago, while rice prices are up 20 per cent from 2 years ago. Rising prices for cereals have been accompanied by declines in cereal stocks for the last 3 years. As shown in Figure 1, grain stocks dropped from an average of 18 per cent of total annual consumption last year to a predicted 13 per cent this cropping year, the lowest in history.

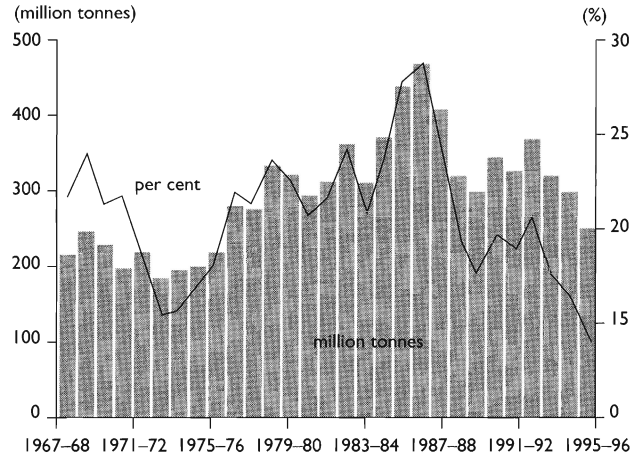

Figure 1. Global grain stocks: level and per cent of consumption, 1967–68 –1995–96
Source: USDA (1995)

Are these rising grain prices and falling grain stocks indications of a new reality for world agriculture, with high prices and continuing food shortages? Or are they a brief interruption in the long-term trend of falling real prices and relatively stable levels of grain stocks?

I'm going to argue that firstly, we are likely to be entering a period of greater instability in cereals prices, which will put significant short-term pressures on poorer developing countries. Secondly, if governments and international institutions sustain support for agriculture at even the reduced levels of the early 1990s, the average real prices of cereals will resume their decline within the next 2 to 3 years, although at a slower rate than in the past several decades. Thirdly, even with declining real prices, progress in reducing malnutrition and improving food security will be slow in much of the world. Fourthly, additional reductions in public investments in agricultural research and economic development could cause rising real food prices and increased hunger and malnutrition.

Increasing Price Variability

The underlying conditions for greater variability in cereals prices have been with us for some time, but the high levels of stocks in the 1980s hid this. The main forces causing increased price volatility are greater variability in weather and crop yields and areas harvested, together with policy reforms that have reduced the incentives for governments to hold stocks. These include trade liberalisation under GATT (General Agreement on Tariffs and Trade) and the reform of United States and European farm support programs.

Weather played a significant role in setting off the current round of price increases. Flooding in the United States in 1993 cut cereals production by nearly 100 million tonnes. Global wheat production fell again in 1994, when droughts associated with El Niño first cut the Australian wheat harvest in half, and then damaged United States winter wheat. In early 1995, wet weather slowed grain planting in the United States and Canada. Drought in Sub-Saharan Africa in 1995 caused production to drop to two-thirds of 1994 levels. These incidents do not appear to be isolated, but are part of a pattern of increased volatility in climate and yield.

On a global basis, the variability in crop yields has increased significantly since the 1960s...

On a global basis, the variability in crop yields has increased significantly since the 1960s, with the variance in yields nearly doubling since that time.

As an example of this pattern, Figure 2 shows the big increase in year-to-year yield variability for soybean in the United States beginning in the early 1970s. Note that while productivity has continued to increase, the volatility in yields has also gone up dramatically.

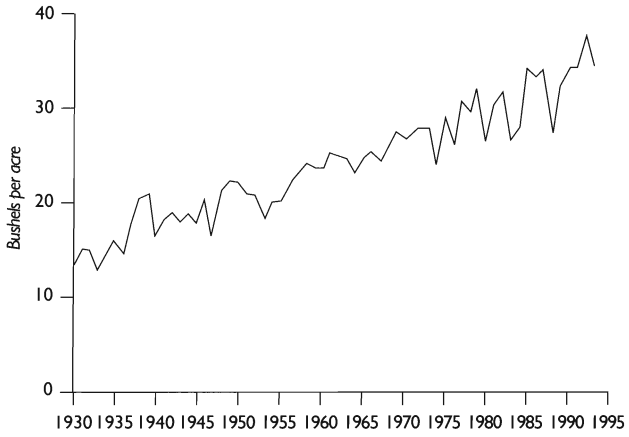

Figure 2. US soybean yields, 1929–93
Source: USDA-ERS (1995)

Policy Reform and Price Variability

Policy reforms have also increased the likelihood of increased variability in prices. Until recently, the developed countries have borne most of the costs of maintaining food stocks, largely as a by-product of domestic farm support programs. However, as North American and European governments scale back farm-price support programs in favour of direct payments to farmers, they no longer need to buy and hold large reserves. In 1996, the United States and European Union will hold less than one-half the stocks they held in 1993. This policy-induced reduction in stocks will probably mean larger price fluctuations in the future, because fewer supplies will be available to the market to dampen price changes when production varies. Private sector stocks are unlikely to make up the difference for reduced public stocks.

Impact of Price Variability on Food Security

A principal concern during periods of sharp price increases should be making sure the poor have enough to eat. Higher international prices hurt poor countries that import a large portion of their food. Sharp price increases can fuel inflation in these countries, place severe pressure on foreign exchange reserves, and can have adverse effects on macroeconomic stability and investment.

A principal concern during periods of sharp price increases should be making sure the poor have enough to eat.

Policy Response to Increased Variability

Is there anything that can be done at the national or international level to deal with the problem of increased variability? Developed exporting countries may want to consider that a failure to meet even commercial export demands during times of shortage can have

devastating impacts on trade relations. In 1973, the American embargo on soybean exports to Japan encouraged the continuation of high protection policies in Japan, and spurred the development of the Latin American soybean industry. Periodic interruptions in grains trade could drastically slow the movement toward more open trade in agriculture. Financial liquidity is not a substitute for the availability of commodity stocks. Therefore, holding stocks in excess of purely commercial pipeline stocks may not be just a humanitarian policy, but a policy with large long-term commercial payoffs as well.

For most developing countries, holding large public grain stocks or encouraging food self-sufficiency are unsustainably expensive strategies.

For most developing countries, holding large public grain stocks or encouraging food self-sufficiency are unsustainably expensive strategies. However, there are things they can do, including:

- holding small grain stocks to provide some insurance against price variability;
- using export credits or foreign exchange insurance; and
- using world futures and options markets to hedge against future price increases.

In addition, it is better to target assistance programs to the poor rather than to implement national food policies that distort domestic prices for everyone. Employment-generation or income-transfer programs, such as food coupons, targeted on the food-insecure could be expanded temporarily to help them deal with the negative consequences of short-term increases in food prices.

We expect greater variability in cereal prices, with possible severe consequences for food security, particularly for poorer nations.

Long-term Prospects for Food Supply and Demand

What about the longer-term prospects for food supply, demand and prices? Do recent price rises mean not only more volatile prices, but also increasing real prices in the future? To answer these questions we need to look beyond the important short-term problem of instability, to the fundamentals underlying long-term growth in supply and demand. To do this, we use IFPRI's IMPACT global projections model to make projections for a number of important outcomes, including:

- country, regional, and global production and world prices of crops and livestock;
- food supply/demand balances and trade;
- per capita consumption of food and calories; and
- the number of malnourished children in the world.

Despite the current run-up in world prices of many commodities, IMPACT results indicate that global production will grow fast enough that world prices of food will be falling slowly.

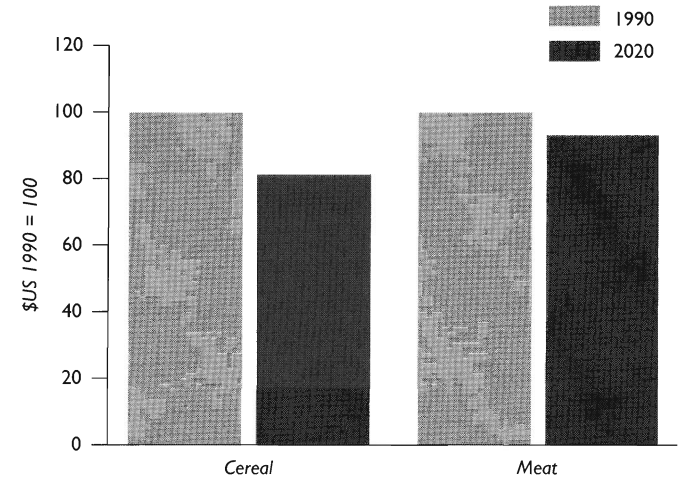

Figure 3. Projected real world prices: cereals and meat

The projected decline in real world prices of meat and cereals is shown in Figure 3. Cereal prices on average are projected to drop by nearly 20 per cent by 2020, and meat prices by about 10 per cent. The decline in prices is accompanied by increasing world trade in food, with the developing world as a group increasing its food imports from the developed world.

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Figure 4 shows cereal supply, demand, and trade of developing countries. The net cereal imports of developing countries will double by 2020, reaching 183 million tonnes. However, in contrast to declining real food prices and expanding world trade, there will be little improvement in food security for the poor in many regions.

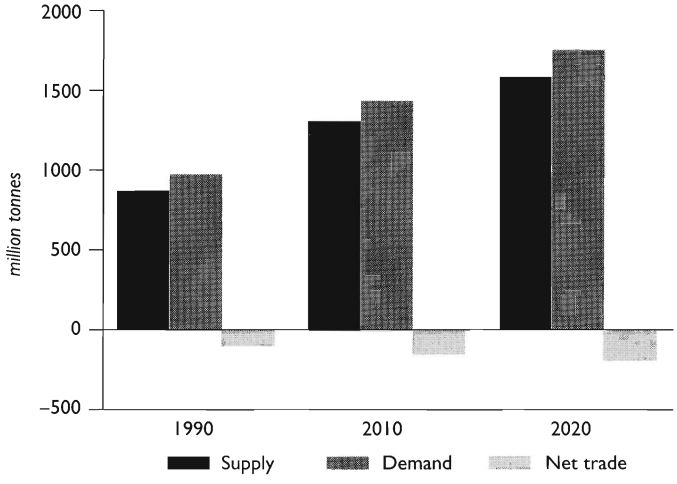

Figure 4. Cereal supply, demand, and net trade of developing countries: baseline scenario

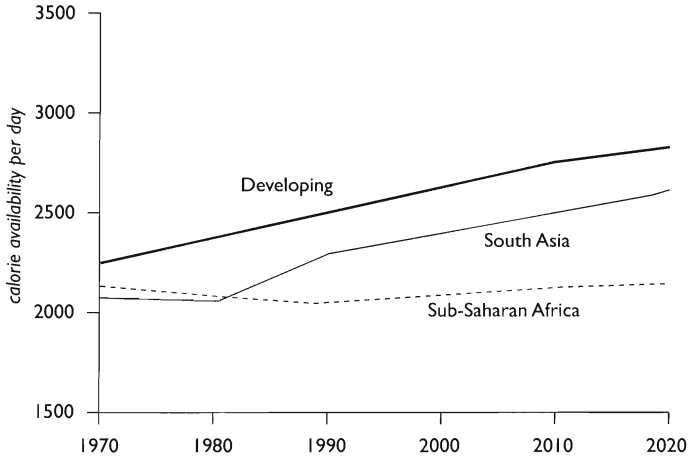

Figure 5. Per capita calorie availability

Figure 5 translates per capita consumption of all foods into average per capita calorie availability. This shows the historical (1970–90) and projected per capita calorie availability for food in the developing world, and in South Asia and Sub-Saharan Africa.

...trends in calorie availability translate into only slow improvement in food security and nutrition.

The results show that there will be virtually no improvement in per capita calorie availability for Sub-Saharan Africa. More progress can be seen for South Asia, where per capita income growth does outstrip population growth. But even here, there is no real closing of the gap between South Asia and the rest of the developing world. These trends in calorie availability translate into only slow improvement in food security and nutrition.

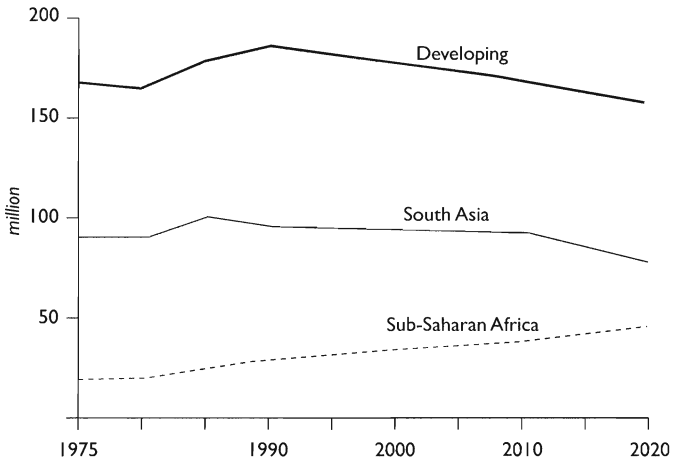

Figure 6. Number of malnourished children (0–5years old)

This point is driven home when you look at Figure 6, which shows the number of children under 5 years of age who were malnourished in the recent past and projected future.

South Asia is home to more than one-half of the world's malnourished children. There has been slow improvement over time in South Asia, mainly in the last decade due to the gradual decline in growth in the population of children under 5 years of age. In Sub-Saharan Africa the picture is worse. There is an increase of 14 million in the number of malnourished children. Even with relatively abundant food in the world, there is not enough growth in effective per capita demand for food in Sub-Saharan Africa to improve the food security situation.

The baseline results illustrate the paradox: declining world food prices coexist with sustained or increasing malnutrition in much of the world.

The baseline results illustrate the paradox: declining world food prices coexist with sustained or increasing malnutrition in much of the world. To give you a better feeling for what drives these results, I will summarise some of the important underlying regional developments.

We project a shift of Eastern Europe and the former Soviet Union from importers of 31 million tonnes of cereals in 1990 to exporters of 15 million tonnes in 2020. Removal of food subsidies and other price distortions, combined with sharply lower incomes, has already resulted in falling per capita cereal consumption in these regions. Feeding efficiency improvements in the livestock industry and a projected gradual recovery in incomes will cause production growth to outstrip demand growth.

We also expect the European Union countries to slightly increase export levels due to structural changes in farming in response to reform of the Common Agricultural Policy. These will enable the agricultural sector to be competitive at world prices. Other traditional developed country exporters will expand their exports with increased demand from developing countries. The main beneficiaries of increased import demand from the developing world will be the United States, which will increase its cereal exports by 50 per cent, and to a lesser extent, Australia and Canada. Australia is projected to nearly double wheat and rice exports, boost coarse grains export by a third, and significantly increase beef and sheepmeat exports. For these countries, slow growth in domestic demand for cereals will permit expansion of exports, despite relatively slow growth in production.

The two giants in the developing world, China and India, will not put severe pressure on world cereals markets. India is projected to remain essentially self-sufficient in cereals at effective market demand, and in fact in the last 2 years has exported nearly 4 million tonnes of rice.

Since the future of the Chinese food economy has been a matter of much debate in recent months, it is worth a closer look.

Chinese grain imports could soar to over 300 million tonnes over the next three decades

Some observers have speculated that Chinese grain imports could soar to over 300 million tonnes over the next three decades, or to nearly double the current world trade in grain. This would drive world prices out of control, thereby drastically reducing per capita consumption and increasing malnutrition in other developing countries.

This outcome is extremely unlikely. Selected results from six scenarios will illustrate this. The scenarios simulate three rates of income growth for China, combined with two resource degradation scenarios. The first degradation scenario maintains trend growth rates in areas affected by erosion and areas affected by salinisation. The second degradation scenario doubles these rates of degradation.

Table 1 shows China's projected cereals imports in 2020 under these scenarios. With slow growth and trend degradation, the total cereals imports in China are projected to be about 25 million tonnes. At the other extreme, with extraordinarily high income growth and rapid degradation, China is projected to import 114 million tonnes of cereals in 2020.

Table 2 shows the impact of these cereals imports on projected world prices for cereals. As can be seen, under the relatively slow

Table 1. China cereal imports: projected in 2020

Income growth rate	*Trend resource degradation*	*Severe resource degradtion*
%	million tonnes	
4.5	25	70
7.0	45	87
9.6	76	119

Table 2. World prices in real $US million tonnes: alternative scenarios for growth in China

		Income growth (4.5%)	*Income growth (9.6%)*
	1990 Base	*Trend degradation 2020*	*Severe degradation 2020*
Wheat	156	132	178
Rice	231	186	215
Maize	109	84	119
Other grains	89	66	82

growth scenario with trend degradation, real world prices of cereals are projected to continue their long-term decline.

What about the extreme case, with rapid growth and severe degradation? World wheat prices in 2020 would be about 14 per cent higher than in 1990. Price increases are even less dramatic for other cereals. Projected 2020 rice and other grain prices would still be lower than in 1990; maize prices would be 9 per cent higher than in 1990. Meat prices may show only small price increases.

The results show that with extraordinarily rapid income growth and severe degradation, China's cereal imports do increase substantially. The effect on projected world prices is significant, but not devastating. The results indicate that world markets are in fact quite resilient and can absorb large increases in Chinese imports without huge price consequences.

China is already a significant player in world food markets, and is likely to become increasingly important. However, China does not represent a major threat to world food markets. Considerable flexibility in supply response still exists, both in China and elsewhere in the world. If anything, the evolution of China into a consistent grain importing country would benefit grain exporters, without causing serious price dislocations.

Doomsday scenarios for China and the world food situation are not plausible, because they ignore the interrelationships and responsiveness built into the world food economy. Nevertheless, a final word of caution is necessary. The progress shown in the baseline scenario requires three forces at work: increased income growth to generate effective demand for food; sustained investment in agricultural research to boost productivity to meet growing demand at reasonable prices; and continued investment in health, education, and nutrition, to translate effective food demand into nutritional improvement.

Doomsday scenarios for China and the world food situation are not plausible, because they ignore the interrelationships and responsiveness built into the world food economy.

Significant policy failures on the part of national governments and international development institutions could yet make the global food situation worse, resulting in rapid increases in malnutrition. Alternative simulations using the IMPACT model show that relatively small reductions in public investment in agricultural research, health and sanitation, and education could push 50 million children to the ranks of the malnourished compared to the baseline projection for 2020. With declining investment in developing countries and income growth, developed countries such as Australia would also face decline demand for exports.

Conclusions

Let's take stock of where we think the global food economy is heading. Firstly, if national government's international devel-

opment institutions maintain investments in agricultural research and development, world food prices will soon begin to decline again. However, the recent volatility in food prices is likely to be with us for some time to come, and will cause severe hardships for the poor in many developing countries. Moreover, even with declining real world prices, there is likely to be very little improvement in food security in much of the developing world, and a worsening of food security in Sub-Saharan Africa.

...if public investment in agricultural research, health, and nutrition declines further, reduced food production and slower income growth in the developing world will lead to higher world prices and a sharp worsening of malnutrition in the developing world.

Furthermore, if public investment in agricultural research, health, and nutrition declines further, reduced food production and slower income growth in the developing world will lead to higher world prices and a sharp worsening of malnutrition in the developing world.

In the long run, good roads and communications, health and education, effective competitive markets, and investments in agricultural research and technologies for rural people are essential not only to increase agricultural productivity, incomes, and food security, but to enhance the capacity of farmers, agribusiness and governments to respond effectively to highly variable prices. As the poor increase their incomes, they can cope better on their own with price fluctuations. Failure to expand investment in education, health care, and infrastructure necessary to generate broad-based economic growth and employment will only increase poverty and malnutrition and weaken the ability of countries to respond to increased price fluctuations.

DR SARA SCHERR joined IFPRI's Environment and Production Technology Division in 1992 as a research fellow to conduct research into natural resource management issues. At IFPRI she heads the multi-country program of research which examines the linkages between natural resource management, human welfare and economic growth, and evaluates alternative policy options to reverse land degradation and promote sustainable development. Before coming to IFPRI, Scherr was a senior researcher at the International Tree Crops Institute and a principal scientist at the International Centre for Research in Agroforestry.

Living with the Land: Building Sustainable Farms and Forests for 2020

SARA SCHERR
RESEARCH FELLOW, INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

If we are to meet this challenge of improving nutrition and livelihoods in developing countries, then food and forest production must nearly double by the year 2020. But can the environment sustain such an unprecedented expansion in production? Indeed, today's newspapers are already full of alarming stories of environmental disasters associated with farming — soil erosion, deforestation, and water pollution.

But even if the threat is real, why should the more developed countries, like Australia, become involved in combating these degradation problems? We believe there are very sound reasons for doing so. Firstly, there are the immediate human and economic costs of land and water that often affect the most marginalised people. Beyond these basic humanitarian concerns, degradation processes can have a broad impact. They have national effects. For example, a decline in food production places greater pressure on other areas to increase food supply, deforestation can increase sediment loads in dams and waterways, and more migrants pour into the capital cities. Large-scale degradation may result in internal instability and international conflict. The political situation is already tense around water supplies in the Middle East and the Indian subcontinent. Declining water tables and salinisation in the irrigated 'rice bowls' of Asia threaten national food supply. Social conflict has risen over soil erosion in the Himalayas and China.

Australia may not suffer directly from degradation in other countries, but its broader geopolitical interest in stability among its trading partners and regional allies will increasingly make these problems feel much closer to home. By contrast, greater rural production, prosperity, and stability in these countries will enhance trade flows, dampen international migration, and relieve political tensions.

Australia has played a key leadership role internationally in recent decades in discovering and promoting innovations in land management, often drawing upon its own national experience in a diverse and bounteous, but often fragile landscape. I hope to impress upon you the promise and importance of your continued leadership in this area in the future.

Towards a 'Doubly-green Revolution'

The past 25 years have seen remarkable progress in new (and sometimes rediscovered) knowledge about the ecology of agricultural systems.

Even if we do care about the threat of degradation, is there anything practical we can do about it? My answer to that is an unqualified 'yes'. The past 25 years have seen remarkable progress in new (and sometimes rediscovered) knowledge about the ecology of agricultural systems. I believe we are truly poised on the edge of what some have dubbed 'the Doubly-green Revolution' — where yield increases together with environmental stability. Whether this revolution will actually happen, on a large scale, or whether it will wither away just as its promise is bearing fruit, is still very much in question. I must admit that when I consider the underfunded and often demoralised state of national and international agricultural research systems, and the difficulties of promoting new visions and paradigms for the future in such a constrained environment, I become pessimistic indeed.

But, on the whole, I am optimistic. Particularly on those days when farmers in Honduras show me the astonishing achievements they have made in transforming degraded hillsides into green and productive crop fields within a few years. Or when I visit farmers in Kenya who have planted thousands of economically productive trees and shrubs on their farms and transformed a previously deforested landscape.

Indeed, there is a myriad of mostly small-scale success stories to show that it is possible to increase agricultural production while actually improving the environment. But the overall pace of transition is simply too slow to keep pace with the growth rates in population, economies and land degradation processes. A larger-scale, more coordinated and more sustained effort is needed to promote improved land husbandry.

I wish to emphasise that it is not helpful to yell 'fire' and rush to fight the problem with half-baked solutions. Too many expensive programs, based on weak information, have run roughshod over the local people whose livelihoods depend upon their environment. Degradation is a longstanding problem that will be with us for a while longer. We want to take action now that will influence long-term trends over large areas. We know from sad experience that 'crash' programs for land improvement, those that do not really solve the underlying technical, organisational and

policy problems, have little to show after the dust settles. So what kind of solid action can we take now, keeping in mind the world in which we want to live in 2020 and beyond?

An Action Agenda for Sustainable Solutions

The first and foremost challenge in combating degradation is to mobilise farmer investment in land quality improvements. Such improvements are needed to protect resources, and to provide a stable base for future production increases. These investments take many forms: tree establishment, small-scale irrigation systems, windbreaks, terracing, and build-up of soil organic matter and nutrients. In irrigated systems, they may include rehabilitation of salinised lands and improved drainage. Many new technical approaches, which combine resource-improving investments with increased yields and income, have emerged through research and field experience.

The first and foremost challenge in combating degradation is to mobilise farmer investment in land quality improvements.

For example, sloping agricultural land systems have developed in Southeast Asia and Africa, supported in many places by ACIAR. Strips and blocks of vegetation, using economic plants ranging from fodder grasses to sugar cane to fuelwood shrubs, are planted along the contour of steeply sloping hillside farms, to stop soil erosion and build up flatter terraces at a low cost to farmers. In one case, grass strip systems reduced soil loss from over 50 tons per hectare to less than 2 tons per hectare.

Silvopastoral systems, mixing fodder trees and grasses, have been modelled after the ones developed in Australia. As a result, calf mortality declines, weight gain in cattle goes up, farmers benefit from timber sales, and soils stay put. New approaches to range rehabilitation are proving successful in Mexico, southern Africa and South Asia.

There have also been major advances in forestry and agroforestry. New research is showing that watersheds can still be protected when forests are transformed to more intensive and economically productive land uses. Farmers all over Southeast Asia are growing more trees and other perennial plants in their farms, to provide continuous soil protection throughout the year and also increase income. A recent study of 53 agroforestry technologies practised in eight Central American countries found that over half were significantly more profitable than annual cropping or forestry alone, even without counting the environmental benefits. Many native Australian tree species have become popular for farm use throughout the developing world, through the services of the Australian Tree Seed Centre, CSIRO, and ACIAR.

Farmers all over Southeast Asia are growing more trees and other perennial plants in their farms, to provide continuous soil protection throughout the year and also increase income.

Well-designed policies can play a crucial role in promoting land-improving investments. Special financing schemes may accelerate the pace of investment. But in the long run it makes sense to promote investments that make financial sense under local conditions, through better information and organisation. Research into agroforestry in many parts of the world now shows that subsidies are largely unnecessary — except perhaps to encourage initial experimentation — if the technologies themselves are well-suited to the local economy and production systems.

Clear and secure legal rights relating to natural resources give farmers the confidence to make long-term land-improving investment.

Clear and secure legal rights relating to natural resources give farmers the confidence to make long-term land-improving investment. A variety of forms may work. For example, new group-based property rights are being tested in some fragile areas in India and the Philippines. These rights have encouraged communities to control the influx of migrants and undertake major afforestation of degraded areas.

Research

If we are to accelerate this investment process, we need to fill some critical gaps in our knowledge about land management. The second action agenda objective is to increase research into land degradation and improvement. Land managers need to know the critical thresholds where degradation will become irreversible. Farmers need lower-cost methods to build up and protect their soil. Farmers' organisations need to learn how to be more effective. Policymakers need to know where the real 'hot spots' are for land degradation, and what kinds of policy action will really work for their problems. We should tap the new information technologies to spread and exchange information widely among land and resource users.

We should tap the new information technologies to spread and exchange information widely among land and resource users.

Yield-increasing and resource-improving technologies for so many different environments can be developed only through creative partnerships between formal research (both on-station and on-farm) and hands-on action projects in the field. Resource management research is an essential component of continued efforts in plant and animal genetic improvement.

Commercial research firms can be expected to address some issues, but the public and non-profit sectors will have to take on most of the responsibility for the agricultural, ecological and policy research. We should not tolerate continued debate presenting an artificial trade-off between yield-increasing research in high potential areas and resource-protecting research for fragile lands, or between plant breeding and resource management research. The increased level of resources needed to capture the synergies between these different activities is an affordable, high pay-off investment.

Institutional Innovation

However, the answers are not just coming from new technology. We now understand much better than we did 25 years ago that social systems are critical for the transition to sustainable land use systems. Market mechanisms alone cannot guarantee good land husbandry, particularly where important natural resource services or impacts do not have a 'market' or a 'price'.

The third action step is to promote institutional innovations. At the local level, successful soil conservation, agroforestry and other land improvements have often come as a result of well-organised local farmer groups. Group organisation and coordination can reduce the costs of land-improving investments, and ensure positive environmental effects for the community as a whole. Australia's own Landcare program is an internationally recognised model for this sort of work.

Group organisation and coordination can reduce the costs of land-improving investments, and ensure positive environmental effects for the community as a whole.

In the Philippines and Pakistan, for example, the introduction of participatory water users' groups to manage communal irrigation systems not only improved equity in water access, but increased overall production and income. By increasing water distribution efficiency, farmers were able to expand the area under irrigation by 35 per cent — more than twice the rate accomplished in the non-participatory systems.

Local organisations will often need critical support services from public agencies to be effective on a large scale. In Cajamarca, Peru, for example, what began 25 years ago as a small-scale collaboration between universities and local NGOs promoting dryland rehabilitation has evolved into a successful district-wide program involving public agencies, farmers' organisations and NGOs, each playing a strategic role.

For critical watersheds, the overall landscape — not just individual farms — must be designed to maintain reliable water flows and high-quality water downstream. New approaches to land-use planning should be adopted, which recognise and mediate conflict among different groups of resource users, and work to reconcile environmental and production objectives. Any regulations should focus on environmental outcomes, rather than on specific practices, to encourage innovation and flexibility. I understand that the Murray–Darling Basin Commission plays such a role in this country.

Rural Economic Environment

Experience also shows us that a supportive policy environment is a necessary condition for successful, large-scale transition to sustainable agricultural systems. The fourth action agenda objective

is to improve the economic and policy environment for farmers and to make it more attractive to invest in land improvements. This means supporting rural development more generally, and reversing the past discrimination in public investment against lower-potential regions, where much of the degradation is occurring. Better marketing infrastructure, diversification, and less distorted pricing policies for agricultural and forestry products and inputs can generate both the incentives and the means for land-improving investment.

Hillside communities in Honduras, for example, have benefited from development of roads, an active vegetable market and general market reforms. These have allowed farmers to intensify production on small plots, reduce degradation pressure on the steepest slopes and nearly halt deforestation.

Public policies also help when they value natural resources to reflect their true scarcity.

Public policies also help when they value natural resources to reflect their true scarcity. When Indonesia reduced its subsidies for chemical pesticides, pesticide use declined. Farmers increased their efficiency and found less environmentally damaging substitutes by adopting integrated pest management.

A Role for Australia

The principal responsibility for implementing these recommendations lies squarely on the shoulders of leaders in developing countries. However, the more developed countries can provide both moral support for national initiatives which move in these directions, and strategic international input. Australia can strengthen its own program of foreign assistance and target it to 2020 objectives, including land rehabilitation. It can support the International Convention to Combat Desertification in Africa, the Rio environment summit initiatives that promote sustainable development in marginal lands, and international research programs on natural resource management. New partnerships can be forged between Australian universities and research centres and their counterparts in the developing countries, to pursue a mutually beneficial research agenda on land improvement.

But a 'laissez-faire' approach will not generate the necessary investment and organisation fast enough to meet the 2020 challenge.

I am convinced of the potential for doubling agricultural production in the developing world, even while protecting the environment. But a 'laissez-faire' approach will not generate the necessary investment and organisation fast enough to meet the 2020 challenge. Vision and leadership are needed to guide and support this process, both within the developing countries, and from international leaders in Australia.

MR JAMES C. INGRAM was Executive Director of the United Nations World Food Program from 1982 to 1992. Prior to that appointment he was Director-General of Australia's development assistance agency (now AusAID) and a career diplomat including service as Ambassador to the Philippines and Canada. For his work in support of rural development and humanitarian relief he received the 1992 Alan Shawn Feinstein World Hunger Award from Brown University. Currently, he is a Visiting Fellow with the National Centre for Development Studies at the Australian National University, a member of the Board of Trustees of the International Food Policy Research Institute, the International Crisis Group, London, and the Crawford Fund for International Agricultural Research.

Hunger, the Environment and Australian Security

JAMES INGRAM
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Almost 50 years ago, when I began my career as a diplomat, the head of the then Department of External Affairs, John Burton, was convinced that in a world of full employment and vastly increased population in Asia there would be rapidly increasing opportunities for Australian agricultural exports. He asked me to prepare a study to test his thesis. Dr Burton turned out to be right. At the time, I was unduly influenced by the Malthusian view. Then, just as now, there were vocal prophets convinced that the anticipated population explosion spelt doom. To quote from one of the more influential: 'Next to the atom bomb, the most ominous force in the world today is uncontrolled fertility. Unbalanced and unchecked fertility is ravaging many lands like a hurricane or a tidal wave. In Puerto Rico, Egypt, India, Italy, and Japan, rampant fecundity has produced more hungry mouths than can be fed. The scramble for bare subsistence by hordes of hungry people is tearing the fertile earth from the hillsides, destroying forests, and plunging millions of human beings into utter misery' (Cook 1951).

Change the names of some of the countries and the paragraph, including its lurid language, and it could have been written today by the Erlichs or even Lester Brown. But the quotation shows how wrong such prophecies can be. The incredible speed of the demographic transition as in Italy and Japan, and its replication in many developing countries, was totally underestimated. So, too, was the associated human ability to develop and utilise technology to bring about an unprecedented increase in human welfare, including food consumption, throughout the world — the one positive achievement of this war-ravaged century. Having once been so wrong, I am sceptical of all predictions based on current trends. I do not know whether humanity will deal successfully over the next decades with the interlinked hunger, environmental

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and development issues, which are so critical for its future. However, I do know that Australia's future will be less secure if public opinion here continues to be insensitive to the extraordinary challenges facing neighbouring developing countries.

Historically, Australia has seen its national security in terms of a dependent relationship, firstly with Britain, and for the last half century with the USA. However, the reality is that Australia is an increasingly lonely country of little strategic value to the sole global super power whose own hegemony may well be challenged from Asia, if not by 2020, then soon after. Regard for our long-term security interests suggests that we need to be very understanding of the considerations driving the developmental policies of our Asian neighbours, even if that means parting company on occasions from other rich countries.

If Australian governments are to feel comfortable with such an approach, it will be essential that public opinion and the media understand that Asia's problems must not be evaluated through the distorting prism of Australia's unique situation and contemporary values. Unfortunately, in the current age of irrationalism, doomsday predictions are increasingly popular. At the same time, democratic politics are driven more and more by populism and by certain single-issue pressure groups which tend to regard the human use of natural resources as inherently wrong or destructive, and to treat our relationship to the natural world as if it were a religious question.

Since returning to Australia 4 years ago, I have been struck time after time by the unreality of 'Green' and media perceptions of issues of environment and development as they affect our neighbours. Senator Bob Brown was recently quoted as saying 'the Australian public is more aware of environmental excellence than any other country on the planet, according to the polls' (Business Review Weekly, 19/2/96). Unfortunately, the Australian environmental movement reflects not only the values of the northern industrialised countries, which have evolved in step with concurrent social movements such as the feminist, antinuclear and consumer protection movements (O'Riordan 1995), but the values of the most sparsely populated, resource-rich of all countries.

Different Concerns

Our Asian neighbours have different environmental concerns. Although just as anxious as the rich countries not to leave an impoverished earth to future generations, in seeking intergenerational equity they place greater weight on alleviating the poverty and raising the living standards of current generations (Dasgupta 1995).

The *2020 Vision* is alive to this reality. It identifies two challenges. Firstly, to eliminate the category of 'food poor' who

currently number around one billion. Secondly, to ensure that what economists call the effective, that is, market-driven, demand for food in the quantities and variety sought by the developing countries will be met in environmentally sustainable ways.

The first requires nothing less than the eradication of poverty, especially in the most underdeveloped rural regions. It is the poor who are hungry because they are unable to produce, or lack the purchasing power to acquire the food needed for active, healthy lives. To meet both challenges will require the economic and social development of these particular regions as well as continuing economic growth of the countries in which they are located, which is also essential if the projected effective demand for food is to be met. As a CGIAR (Consultative Group on International Agricultural Research) institution, IFPRI, in spelling out the Vision, has placed emphasis on strengthening agricultural research and extension in developing countries. This is entirely appropriate since, dollar for dollar, such spending is the most effective way for the international community to help. However, IFPRI also recognises that much more is required, particularly from the governments of developing countries. Indeed, they hold the key to success, but they can be helped and hindered by the rich countries. What should Australia do?

Regional Focus

Firstly, let me say that given Australia's status as an Asia–Pacific power with a relatively small economy, there is in practice no option but to focus our efforts on that region. The hungry poor in Africa, the most critical area, are best assisted through our strong support for multilateral institutions such as CGIAR and the World Bank. In South Asia, the hungry poor will still number hundreds of millions in 2025 unless special action is taken. In varying degrees, the whole region, especially India, Bangladesh, China and Indonesia, face extraordinary problems in achieving sustainable development. High growth rates are required if the expectations of their people are to be realised and their effective demand for food met.

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Canberra is said to be remote from the 'real' Australia. On this issue, at least, I certainly hope so. Unfortunately, entirely unrealistic views about the hunger–population–environment nexus have quite wide currency in this city. Take the issue of population. There is a vocal desire to believe that the only way to save the planet and Australia is to stop population growth. However, the dynamics of the ongoing global reduction in fertility and its link with ultimate population are simply not understood. Even if by some miracle global fertility suddenly fell to the level that balanced mortality, which is the approximate situation in the rich

countries today where couples have exactly enough surviving children to replace themselves, global population in 2025 would still be more than seven billion. This is only about one billion fewer than the most likely UN population projection for that year (Bongaarts 1995; Bos 1995). In short, no matter how much faster the demographic transition can go, our neighbours will continue to face a daunting developmental task even to stand still in terms of GNP per capita.

Economic Growth Speeds Transition

Birth control programs, already widespread in the developing countries, continue to have their place. However, rapid economic growth is essential for a speedier demographic transition. Australian opinion needs to accept unreservedly that the governments of our region have no alternative but to follow the Western, technology-driven model of economic growth. In every country the population seeks the material benefits that only economic growth can bring. Knowledge of Western affluence has been disseminated across the planet by the mass media. The money economy as well as radio and television reaches virtually everywhere. Politically, governments of developing countries rightly feel that they must respond to the felt needs of their populations for a higher standard of material life. The possible deleterious effects on the planet, for what is necessary today to bring some small increase in incomes, are relatively low in the concerns of their governments. In any event, current global pollution is seen as the responsibility of the rich countries.

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In response to this attitude, the World Bank and the United Nations established the Global Environment Facility (GEF) in 1991. This was intended to encourage developing countries to invest in industry in ways that would minimise adverse effects on the global environment. This is done by underwriting the additional costs of this technology compared with conventional, cheaper technologies. Enlargement of the GEF to encompass environmental costs associated with the intensification of agricultural production in marginal areas, where the food poor are concentrated, warrants investigation. Given the weak political power of farmers and herdsmen in such areas, it is most unlikely that governments will feel able to devote the financial resources necessary to reduce the number of food-poor.

Raising living standards will require an explosion in the production of energy. Increasing agricultural production will itself call for substantial increases in the use of commercial energy, although agriculture will take a small share of total energy output (IFPRI 1995). Most energy will be required for the intensive and

rapid urbanisation of our neighbours. By 2020 China and India are projected to produce about one-fourth of the world's emissions of carbon dioxide (Livernash 1995). If the Australian environmental movement is genuinely concerned about stabilising global carbon dioxide emissions at the lowest possible level, it should be encouraging, certainly not opposing, the development of nuclear power in Asia, including Indonesia, and the export of uranium. Given international nuclear safeguards, opposition to nuclear weapons will not be seen as a legitimate justification for a negative attitude. Rather, it will be seen as a rationalisation of a continuing fear and distrust of Asia and a lack of sympathy for the need for our neighbours to use all available means to move as rapidly as possible to develop the necessary infrastructure to help raise the living standards of their peoples. In the light of the hundreds of nuclear power stations already operating in densely populated regions of the planet, concerns about the alleged dangers for Australians of a Chernobyl-type catastrophe in Java, nearly 2000 kilometres from our almost uninhabited north-west, will not be taken seriously. Instead, they will be seen as the self-indulgent preoccupations of a tiny, but undeservedly fortunate, minority of the world's peoples heedless of the immense problems of their neighbours.

Immigration Pressure

Australia's isolation has so far spared it from the influx of illegal immigrants already being experienced by the USA and the European Union. There have been fewer than 2000 boat people to arrive on our shores. Failure to eliminate rural poverty in Asia will accelerate the movement to urban areas and make economic development even more complex and costly. Pressure to emigrate will become much stronger. With the rise in sea levels associated with global warming during the next century, upwards of 75 million in Bangladesh, India and China alone could be displaced (Houghton 1996). The more crowded our neighbours become the more attractive our space and affluence will seem to their peoples, especially if their material aspirations are not being satisfied. So far global population conferences have not made recommendations concerning immigration. However, it seems unlikely that the situation will continue until 2020 especially if American/European hegemony is seriously challenged. Unfortunately, vocal public opinion is myopic in this regard. For example, some 90 per cent of the 270 submissions to the committee chaired by Barry Jones on Australian population called for reduced or nil immigration and for a stable or lower population (Australian Financial Review 23/4/96; see also Cocks 1996).

Failure to eliminate rural poverty in Asia will accelerate the movement to urban areas and make economic development even more complex and costly.

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The surge in armed conflict arising from ethnic hatreds since the end of the Cold War may well be followed by conflict over resources, especially water. No rich country has a greater interest than Australia in promoting peace and stability in the Asia/Pacific region. In an increasingly interdependent world, pressure to reduce armed conflict and the displacement of populations will hopefully lead to the emergence of stronger international organisations with a degree of coercive power. The recent, much wider use of sanctions authorised by the UN Security Council could be extended beyond issues of military security. Among the many recent proposals for UN reform has been the extension of the existing Security Council's mandate into areas of humanitarian, economic and social concern. While these proposals are unlikely to be acted upon in the near future, under different circumstances they may be revived and implemented in one form or another. If the challenges faced by the developing countries become too unmanageable they may well argue that the currently regarded sovereign resources of each nation should be seen as a form of trust to be managed not simply on behalf of the lucky possessing country but on behalf of all humanity. The pressures already exerted on states rich in tropical forests, and even the reaction to Iraq's takeover of Kuwait and concern about the future supply of oil are arguably the first steps along such a path. Given the difficulties that our neighbours face in eradicating hunger and raising overall living standards, it is not difficult to envisage scenarios in the next century under which the international community concludes that locking-up resources to preserve or recreate a pristine Australian environment does not strike the best balance for the overall well-being of humanity.

Program of Action

The *2020 Vision* identifies a program of action containing at least 17 economic and social measures to be carried out by the developing countries (IFPRI). They include delegation of responsibility and authority to local governments, primary education for all children, access for all to primary health care, and the empowerment of women. It is recommended that donors of development assistance should focus their aid on governments committed to the goals of the program of action. The implication is that external help should not otherwise be extended.

I have no quarrel with most of the program. My concern is that every one of the 17 proposals will require political decisions of a fundamental kind — decisions about resource allocation, government spending priorities and about changing social structures. Such decisions are always contentious, in every country. In

the rich countries people groan under the burden of an unprecedented rate of change. That change is nothing compared to the changes in developing countries. The process of development itself sets a cracking pace of social change. Indeed, the rise of religious fundamentalism is a reaction against the pace of modernisation.

The process of development itself sets a cracking pace of social change.

The rich countries exert considerable power over the domestic policy agendas of developing countries through the provision of aid, limitations on access to their markets, and multilaterally through their dominance of the World Bank and International Monetary Fund. However, aid is driven by an ideology of development that has made a series of major shifts in the last 50 years. It is much affected by prevailing political, economic, social and cultural norms in the rich countries. Yet, when an industrialised country finds itself in a situation where powerful but unwanted changes are being forced on it, it immediately appeals for recognition of the great political difficulties it faces and the need for time to bring about the necessary changes in public opinion. Britain is notorious within the European Union in this regard. Given Australia's unique geopolitical situation, I suggest that we would be wise to be very understanding, and active in support of the Asian developing country viewpoint in international development and trade organisations.

Influence of Bilateral Aid

We need to be especially careful about how we use our bilateral aid to influence the domestic social policies of recipients. That task is made more difficult by the eager adoption by Australian aid NGOs of the latest fashionable thinking from the northern hemisphere. I am not suggesting that many of the prescriptions for successful modernisation which will promote growth with substantial equity have not been identified. Developing countries are as entitled as we are to proceed at a pace which suits their cultures and circumstances. We should have enough humility to know that our inability to create utopia or Arcadia in Australia — more especially our inability to agree on just what would constitute such states — should caution us against zealous attempts to prescribe development policies for societies which at best we only partly understand. In short, let us heed the physicians nostrum: first do no harm.

Developing countries are as entitled as we are to proceed at a pace which suits their cultures and circumstances.

To sum up, in relation to the development of our Asian neighbours, Australia cannot afford official policies or popular attitudes steeped in insularity and provincialism. If we continue to do so, the full acceptance we seek from our neighbours will go on eluding us. It is essential that Australia be sympathetic to the exceptional developmental and social problems faced by our neighbours in raising

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living standards. That sympathy should translate into an aid program especially sensitive to their needs as they see them. It will also be essential that in international development forums we show great sympathy for, and on occasions actively support, developing countries in the face of pressures that reflect the interests of the rich countries of the northern hemisphere.

Australian governments have broadly acted in accordance with these principles. For example, Australia has broken ranks with the industrialised countries in rejecting the latter's call for the World Trade Organisation to take action to protect global labour standards (Australian Financial Review 24/4/96). However, populist pressure to follow fashionable policies unsuited to Australia's unique circumstances is still evident.

Overall, Australian policies should be underpinned by an ethic, or an enlightened self-interest, which recognises that in a warmer, more crowded, potentially more turbulent yet much more interdependent world, the utilisation of Australia's environment and resources should have increasing regard for the overall well-being of all humanity, not only the lucky occupants of this so far fortunate land.

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Food Security and Agricultural Trade Liberalisation

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First of all, I would like to congratulate both the Crawford Fund and IFPRI for organising this very timely seminar on an issue of such global importance as the future of agriculture and the environment. This is part of IFPRI's broader activities connected with its *2020 Vision for Food, Agriculture and the Environment.* Of course, as a major agricultural producer, Australia has a particular interest and role in global efforts to ensure food security.

I want to advance the proposition that trade liberalisation is a necessary condition for global food security as we look toward the food supply challenges of 2020. This is not to say other things are not important, especially the role of agricultural research both privately and publicly funded, nor is it to suggest that foreign aid cannot help. It is to suggest that all these efforts will come to little if prices and incentives to invest are disturbed by protectionist agricultural and other trade policies.

Malthusian fears of imminent food shortages caused by a growing population have been a recurring theme in history. During the 1970s, the Club of Rome predicted famine and disaster, and more recently Lester Brown has been a leading doomsayer. History has proved the alarmists wrong. Over the past 50 years, the growth of global cereal production has well and truly outstripped population growth.

Despite this good news, abject poverty is still widespread in many countries and environmental degradation proceeds. Undeniably, food security, or more precisely food insecurity, is a major issue which the international community needs to address. The current concern about declining cereal stocks and the World Food Summit are manifestations of worldwide interest in the issue.

Myths and Misunderstandings

While acknowledging the gravity of the situation, it strikes me that some myths and misunderstandings have grown up around discussions of food security. These are unhelpful to sensible and constructive discussion on how to enhance food security and could in fact handicap progress, so I will try to dispel some of these myths.

Some of the most vocal supporters of self-sufficiency, such as Japan and Korea, clearly do not have a comparative advantage in agriculture.

Myth 1: Food security and food self-sufficiency are synonymous

- For many countries there is no economic logic in striving for food self-sufficiency. Food self-sufficiency only makes sense when a country has a comparative advantage in food production, but even then, countries like Australia will still import food. Some of the most vocal supporters of self-sufficiency, such as Japan and Korea, clearly do not have a comparative advantage in agriculture. In fact, the Japanese pay a very high price for their policy of self-sufficiency. For example, consumers pay five-and-a-half times the world price for rice. Notwithstanding these very expensive efforts, these countries, as their incomes have risen, have found themselves relying on greater and greater quantities of imported food.
- Food security, on the other hand, is ensured through food self-reliance, which is a much broader concept that takes into account the role of international trade. It implies, in most cases, a combination of domestic production and having export-generated income to be able to import food to meet the needs of the population.

Myth 2: Food security is all about increasing food production

- With the prospect of the world's population increasing by about 2.5 billion over the next 25 years, there will have to be a significant increase in global food production. At the same time, when looking at the present situation, it is tempting to over emphasise the supply side (that is, production) to achieve food security. In fact, serious food shortages can exist (as in Sub-Saharan Africa) even while there are substantial grain surpluses in other parts of the world, or for that matter in the same country that is experiencing famine.
- In terms of achieving some immediate improvement in food security at the national and household levels, the issue is more of deficient demand rather than deficient supply. For example, the FAO in one of its recent papers indicated that food insecurity was a problem of inadequate access to food resulting from inadequate purchasing power. It stated that 'the immediate attack on food security must place heavy emphasis

on poverty alleviation, and in the longer term on poverty elimination generating the effective demand that is the economic engine of food production growth'.

Myth 3: The current 'food security crisis' is in some way the fault of the 'rich' developed countries and they should 'fix' the problem

- The present so-called crisis is greatly overstated. As mentioned earlier, global food production has been increasing faster than population growth over the past 50 years. The global food situation has improved significantly. However, in some countries, especially in Africa, the situation has worsened. The causes for this are complex and vary between countries, although in many areas inappropriate policies (for example, the taxing of agriculture or an overvalued exchange rate) have played a major role. Individual countries are the ones most able to improve their food self-reliance through agricultural development and increased purchasing power, by adopting macroeconomic, trade and farm policies to increase economic performance through ever more economically efficient allocation and use of scarce resources.
- Invariably, food shortages on a national scale are attributable to institutional failures, such as in Somalia, inappropriate policies and endemic poverty.
- It is far too easy to blame the 'rich' developed countries for the food security problems of some net food importing developing countries. The developed world can assist these countries with technical and financial assistance and emergency food aid, but ultimately the concept of the primacy of national responsibility must apply.

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Myth 4: Current food shortages can be resolved through increased food aid

- Food aid never has been, and never will be, the solution to long-term problems of food supply and availability. It is only effective in dealing with short-term food emergencies. Sustained food aid to a particular recipient sends exactly the wrong message. Like subsidised exports, long-term food aid simply depresses prices received by farmers, and as a result, discourages investment in agriculture.

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Myth 5: Dependence on food imports is a 'bad' thing and makes countries vulnerable

- Countries should pursue economic activities in line with their comparative advantage. This will maximise their growth potential and the capacity of their citizens to purchase the food

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they need. The improvement in food security in several regions, including North East, North and East Asia, has been because they relied on trade. Japan and Korea are examples of countries which have benefited from increasing levels of relatively cheap food imports financed by flourishing exports of non-agricultural goods. Trade has been an important driver of their economic growth.

- Economic growth enhances food security by increasing individuals' control over resources and therefore their access to food as their incomes grow. Furthermore, the proportion of their income spent on food declines and the risk of their falling into food insecurity diminishes.
- It should also be remembered that food trade plays an important role in stabilising supplies and prices. Without trade, domestic production fluctuations would have to be borne by adjustments in consumption or stockholding, or both. Trade allows domestic fluctuations to be reduced and relieves countries of at least part of the burden of stockholding. This is to the advantage of both exporters and importers.

Myth 6: Freeing up world markets and getting rid of agricultural subsidies will have a negative impact on agriculture and on global food security

- In fact, the opposite is true. Trade liberalisation is a major contributor to economic growth and helps to provide the wherewithal to improve income levels and hence food security. Another benefit of trade is the increased potential for technology and capital transfers to increase agricultural production.
- Over time, the distorting impact of interventionist agricultural policies of the major OECD countries has resulted in excessive swings in commodity trade and prices. Export subsidies have had a particularly pernicious effect on food production in non-subsidising countries. The export subsidy wars of the 1980s depressed global prices and discouraged agricultural production in non-subsidising countries, such as Australia, and in food-importing developing countries.

Export subsidies have had a particularly pernicious effect on food production in non-subsidising countries.

- The fact is that low prices create food shortages, not high prices.

Myth 7: World commodity prices, especially for grains, are at record highs

- In nominal terms, grain prices are at their highest level in the past decade, but in real terms (that is, after adjustment for inflation) they are comparable to prices in 1984–85. Real prices have been steadily declining over the long term and this trend is expected to continue into the future.

Myth 8: Uruguay Round negotiations on agriculture will significantly push up world commodity prices to the detriment of food-importing developing countries

- This assertion is false. A recent study by the IMF shows that world food prices are likely to increase by a modest 4 per cent as a result of the Round. Other studies, for example by the FAO, have forecast similar increases over the longer term.
- The FAO has also forecast that as a result of the Uruguay Round, agricultural trade could rise from its 1987–89 level by over US$25 billion by the year 2000, with over US$8 billion accruing to developing countries. Overall, given a greater slowdown in developing countries' imports than exports under the Uruguay Round, the FAO forecasts that the agricultural trade balance of developing countries as a whole will improve. UNCTAD (United Nations Conference on Trade and Development) has estimated that, on balance, the Uruguay Round will lead to a reduction in absolute poverty of about 1.4 per cent.
- In any case, under the WTO (World Trade Organisation) there is provision in the so-called Marakesh Ministerial Decision *Concerning the Possible Negative Effects of the Round on Net Food Importing Developing Countries* for assistance to developing countries adversely affected by the agreements. The Round also provided for special, differential treatment of some developing countries during the reform process.

The Importance of Agricultural Trade in Food Security

The issue for Australia is distortions in world agricultural markets and how to get rid of them. The FAO has expressed the importance of agricultural trade in food security very succinctly:

> 'Food trade is vital to world food security. Without trade, countries would have to rely exclusively on their own production: overall incomes would be far lower, the choice of goods would be far less and hunger would increase.' (FAO Technical Paper Food and International Trade WFS 96/TECH/8 provisional version, April 1996, page iii.)

Food trade is vital to world food security.

Agricultural markets have long been bedevilled by subsidies and protection of various kinds, so there has been little opportunity to benefit from comparative advantages and economic efficiency in international agricultural trade and production.

This has affected Australia, but it has also affected developing countries with significant agricultural sectors. The interventionist policies of the majors have seriously distorted global agricultural trade and resource allocation. Commodity prices have been artifi-

cially depressed by surplus production in these countries and by the impact of export subsidies.

The consequences have been obvious. Low commodity prices have been a major disincentive to the growth of agriculture in many developing countries even though these countries often have a significant comparative advantage in agriculture.

The damage caused by this misallocation of resources was most obvious during the mid-1980s. Although global food production was rising, most of the increase occurred in the subsidising countries of North America and Europe. Consequently, world agricultural prices declined and agriculture in much of the developing world declined.

It has only been in the past 8 years that the world has tackled the basic issues of freer agricultural trade. The Uruguay Round result on agriculture was an important breakthrough with the complex problems of agricultural trade being addressed in multilateral trade negotiations. For the first time, agriculture has become subject to important rules and disciplines in the key areas of market access, export subsidies and domestic support.

For the first time, agriculture has become subject to important rules and disciplines in the key areas of market access, export subsidies and domestic support.

While this is an important first step, much remains to be done to achieve full liberalisation in agricultural trade. Agriculture in the major OECD countries still remains highly protected and supported. In a recent report it was estimated that the total value of farm support among OECD countries rose by 2 per cent to US$182 billion in 1995.

Prospects for Real Reform

Despite this, we are optimistic that there will be further reform of global farm trade. There are several reasons for our optimism.

For example, recognition is growing that agricultural policies will need to work with, rather than against, market forces. We are starting to see the impact of sustained economic growth in many non-OECD countries, especially in Asia and South America, on the demand for agricultural products. Rising per capita incomes in those countries have underpinned buoyant demand for most food commodities. These trends will be important in driving future trade policy reforms.

Regional trading arrangements, such as APEC (Asia Pacific Economic Cooperation), although in their infancy, have already had a major impact on the trade environment. Some regional trading blocs are setting a fast pace with ambitious market opening agendas, but the important point is that agriculture must be part of this process.

Regional developments should also work hand in glove with the multilateral process of the WTO, as multilateral negotiations

are likely to deliver more broad-based and comprehensive trade gains. It is increasingly recognised that there should be further multilateral negotiations on agriculture and indeed the Uruguay Round specifically mandates that a further round of negotiations should begin before the end of this decade.

In this context, the forthcoming WTO Ministerial meeting in Singapore in December is of particular importance. One of the lessons of the last multilateral round of trade negotiations is that the whole process can drag on for years and be held hostage to disputes over a wide range of procedural issues. It is important that we do not fall into the same trap in the next round. Early preparations for the negotiations should help.

We hope that there will be agreement in Singapore to begin preparatory work on agriculture as part of the built-in agenda of the Uruguay Round. This will be an important objective for us and for other members of the Cairns Group at Singapore as it will set in train the process leading up to the resumption of mandated negotiations in 1999. We will be looking for these negotiations to deliver substantial and further reform in the key areas of export subsidies, domestic farm support, and improvements in access conditions for agricultural products.

A more open trading environment for agriculture, coupled with the elimination of various forms of subsidies, would be a major plus for the world economy. In the longer term, this on going process of agricultural trade liberalisation will make us all winners.

In the longer term, this on going process of agricultural trade liberalisation will make us all winners.

Most importantly, agricultural trade liberalisation and other farm reforms will play a major role in helping to enhance the food security of many countries. This may be achieved by:

- encouraging a better climate for wealth creation through agriculture and non-agricultural activities — the capacity to grow or to buy food is enhanced;
- encouraging a more efficient allocation of resources between sectors and between countries — those countries with a comparative advantage in food production will be able to utilise fully this advantage and will no longer be constrained by artificial restrictions;
- encouraging countries to adopt policies to take advantage of new market opportunities as a result of liberalisation — it will be easier for producers to respond to market signals; and
- reducing the need for excessive and expensive stockholding — confidence will be greater in the market, as will the ability of producers to respond to its signals.

However, it needs to be recognised that the extent to which these benefits from trade liberalisation are realised will depend critically

on the capacity and the political willingness of the developed countries to begin to show world leadership in trade liberalisation. This involves in particular opening further their markets to exports, especially of labour-intensive manufactures, from developing countries. In this way, they will provide the incentives for developing countries to adopt 'sensible' economic policies to create an environment conducive to economic growth.

...food security is an issue that has the potential to divert and limit progress in future multilateral trade negotiations.

We also recognise that food security is an issue that has the potential to divert and limit progress in future multilateral trade negotiations. So part of our preparation for negotiations is to dispel some of the myths I identified earlier, and to put the relationship between trade liberalisation and food security on a sounder, less emotional and political footing.

In this paper, I have dwelt on the importance of trade liberalisation for enhancing food security and the relationship between the two issues. I have done this because it is our special area of interest. At the same time, we are also very aware of the wider picture and recognise the important role played by international research organisations in enhancing the capacity of all countries to increase food production and to do it more efficiently. In the Australian context, I want to acknowledge in particular the role of ACIAR, the CSIRO, and of course the Crawford Fund, and to congratulate them for their efforts.

DR BOB CLEMENTS is Director of the Australian Centre for International Agricultural Research. Prior to this appointment in 1995, he was the Chief of the CSIRO Division of Tropical Crops and Pastures. During his research career, he was responsible for breeding a number of significant forage and pasture legumes which have greatly assisted beef cattle production in northern Australia. He has demonstrated outstanding leadership in bringing together diverse R&D providers, delivering benefits to industry, and strengthening Australia's link with international research centres.

Straight to the Point

Bob Clements
Director, Australian Centre for International Agricultural Research

We have been privileged to hear some excellent presentations from several eminent speakers and I am privileged to have been invited to draw together the threads and point the way forward. In doing so we could ask these questions.

- What have we heard?
- What does it mean?
- How should we react?

We have heard about a massive challenge — a challenge that not only deserves our close attention, but also requires action on our part. The challenge is to increase the food security, reduce the poverty, and protect the resources of 8 billion people by the year 2020.

Per Pinstrup-Andersen told us that right now more than one billion people live in abject poverty. They do not earn one dollar a day. Almost one billion people do not have reliable access to the food they need to survive and 1.3 billion people have no access to clean drinking water. In addition, 185 million children are inadequately fed, resulting in many thousands of children going blind each year from vitamin A deficiency.

The pressure of feeding the present population of the world has exacted a grim toll on our natural resources with land degradation occurring on 30 per cent of Africa's agricultural land, 27 per cent of Asia's agricultural land, and 18 per cent of Latin America's agricultural land. Most of the world's marine fisheries are at crisis point. More than a quarter of the main marine fisheries worldwide are overexploited, and another two-fifths are fully exploited. More than 15 million hectares of tropical forest are destroyed every year.

That's the situation now. Not in 2020, but right now.

In the year 2020, we must feed an additional 2–3 billion people. That's roughly 90 million more people every year. Almost

all of these people will live in developing countries with 1.5 billion living in Asia, next door to us. Every year, the population of China is increasing by about the present population of Australia. Every year, the population of the world is increasing at more than four times the present population of Australia.

By the year 2020, the world must produce 55 per cent more grain, 75 per cent more livestock products, and 50 per cent more roots and tubers than at present...

By the year 2020, the world must produce 55 per cent more grain, 75 per cent more livestock products, and 50 per cent more roots and tubers than at present, to feed a population of about 8 billion people.

Most of this growth in food production must come from the developing countries themselves. Let me put this in context for you. Australia, as you know, is a major food exporting country. But all Australia's exports — grain, meat, fruit and vegetables — could not supply even one-tenth of the projected increase in world population by 2020. Every year, China produces more than 20 times more grain than we do.

Of course, the developed world can produce more food, and as Mark Rosegrant and Geoff Raby have told us, trade liberalisation will help this to happen. But most of the extra food must be produced by the countries in which it will be eaten.

So that is the challenge for us.

How do we react?

The starting point is to recognise the problem, and to understand what it means for us in Australia. As several speakers have stated, notably Jim Ingram, Australia cannot stand back from the challenge of feeding an extra 2–3 billion people. Most of them are at our doorstep. They are our neighbours. They look through our windows. They are our emerging markets. Our lives and theirs are inextricably linked.

Almost every person at this conference will still be alive in the year 2020. We will live to see 8 billion people on earth. It is not someone else's problem. It is our problem. Ours is the generation that must make the right decisions to meet the challenge that has been described to us.

We can reduce poverty, and we can conserve the natural resources that underpin food production, but it will require a major international effort for it to happen.

The good news is that the world can feed 8 billion people. We can reduce poverty, and we can conserve the natural resources that underpin food production, but it will require a major international effort for it to happen.

The speakers at this conference have described to us the nature of the effort that must be made:

- strengthen the capacity of developing country governments to perform appropriate functions;
- enhance the productivity, health and nutrition of poor people — educate them, give them adequate health care and clean water, empower women, and provide access to resources and employment;

- accelerate agricultural productivity recognise and exploit the key role of agriculture to meet food needs and stimulate income growth, increase investment in agricultural research because agriculture is the engine of growth;
- manage natural resources sustainably — Sara Scherr has given us some leads on how this can be done;
- develop effective markets, and provide access to small-scale credit;
- maintain and focus overseas development assistance — the key issue is not how much money is provided, but how it is spent.

Let me expand on this action plan from the special perspective of ACIAR. I expect that most people in this room have never heard of ACIAR, or if they have, they have only a vague idea of what ACIAR does. ACIAR is a small statutory authority through which the Australian Government invests about $40 million each year in the business of international 'public good' agricultural research.

If agriculture is the engine of growth in developing countries, agricultural research is the petrol that powers the engine.

What is international agricultural research? It is research that is usually (but not always) funded and conducted by developed countries to provide benefits for poor people in developing countries. Agricultural research provides the foundation for innovation in agriculture, and innovation provides the basis for growth. If (as Per Pinstrup-Andersen has stated) agriculture is the engine of growth in developing countries, agricultural research is the petrol that powers the engine.

We in Australia know a lot about agricultural research and what it can do. When this country was first settled by Europeans, we had to invent a whole new agriculture, because the agricultural practices that worked well in Europe didn't work here. In the process, we not only invented our own ways of doing things; we also developed one of the strongest teams of agricultural scientists in the world. Agricultural research is one of the things Australia does best.

Australia is unique among the developed countries in possessing a very large area of agricultural land in the tropics and subtropics. Over the years we have focused a lot of our agricultural research on solving the problems of our tropical north — the very same problems that confront our developing neighbours. We share the same climates. We grow many of the same crops and animals that they grow. We have to contend with many of the same pests and diseases. The more we solve our own agricultural problems, the more we should be able to help them to solve theirs.

Australians are aware that agricultural technology cannot simply be transposed from one country to another.

Of all people, Australians are aware that agricultural technology cannot simply be transposed from one country to another. We learnt that the hard way. We know that agricultural research — international agricultural research — is needed to modify the technologies from the developed world to suit the developing

world, and to develop new technologies that meet the special requirements of developing countries. Without research, many well-intended agricultural development projects are certain to fail.

Some of this international agricultural research is conducted by a network of international agricultural research centres such as the International Food Policy Research Institute (IFPRI). Others that are well-known to Australians are the International Rice Research Institute (IRRI) and the International Wheat and Maize Improvement Centre (CIMMYT) in Mexico.

Australia is a strong supporter of these international centres — one of the top dozen or so donor countries — and ACIAR manages Australia's contribution to these centres as part of its operations.

But most international agricultural research is not done by the international centres, but by individual developed countries like Australia working with individual developing countries in bilateral arrangements.

ACIAR's main business is in developing and funding collaborative, bilateral agricultural research projects involving scientists in Australia and partner countries. Right now, ACIAR is funding and managing more than 100 collaborative research projects in 22 developing countries, mainly in the Asia–Pacific region. These projects span a wide range of activities, from crop sciences to animal sciences, from forestry to fisheries, from grain production to grain drying, from pest management to the improvement of agricultural policy. These ACIAR projects are linking together more than 1000 scientists from more than 200 research institutions in Australia and the Asia–Pacific region.

Through these collaborative research projects and those funded by other developed countries, and through the efforts of the international agricultural research centres, scientists in developing countries are empowered to develop the new agricultural technologies that will lift agricultural production to meet the *2020 Vision.*

The good news is that this investment by Australia in international agricultural research is extraordinarily effective.

The good news is that this investment by Australia in international agricultural research is extraordinarily effective. Not only does it provide big benefits to the developing countries, it also provides big benefits to Australia. We are helping ourselves by helping our neighbours.

Let me explain. If we evaluate projects just in terms of the new technologies that are developed — the products of research, or direct benefits — we know that ACIAR projects have an average Internal Rate of Return of 36 per cent. On average, one-third of those benefits come back to Australia. We see those benefits in the form of new technologies that work just as well for us as they do

for our neighbours. These technologies include new plant varieties, new vaccines, new diagnostic tests, new ways of controlling pests, and new ways of managing land and water.

Did you know that Australia's unique ability to provide a same-day diagnosis of foot and mouth disease was the product of an ACIAR project?

Did you realise that everything we know about the pawpaw fruit fly — even its name — came from research funded by ACIAR?

Did you know that Australia's modest investment of less than $1 million per year in CIMMYT returns $70 million to Australian wheatgrowers every year?

But this sharing of direct benefits is only part of the story. Many of the benefits are indirect, and almost impossible to measure. However, there is persuasive evidence that by helping our developing neighbours to lift their agricultural production, we stimulate their economies. We increase their ability to purchase imports, and curiously enough, they import more food. They produce more food, but they also buy more food.

...there is persuasive evidence that by helping our developing neighbours to lift their agricultural production, we stimulate their economies.

There are many other indirect benefits from international agricultural research, but I do not wish to imply that we should be motivated only by consideration of benefits to Australia. Of course, our main motivation should be the imperative to achieve the *2020 Vision.*

Through agricultural research, we can meet the challenge of feeding 8 billion people. But let me tell you, we cannot do it without agricultural research! We welcome Minister Downer's review of Australia's aid program. I assure you that it will reveal clearly the central role of international agricultural research in achieving the *2020 Vision.*

There is a dangerous complacency about agriculture these days. We see it as a sunset industry. The very success of modern agriculture lulls us into a false sense of security. We think we can coast ahead to the year 2020 armed with our present technology, without putting any more petrol in the tank. But I have news for you: the track is uphill, not down. The bus is already crowded with more than 5 billion people, and there are at least 2 billion more to get on; and most of the passengers can't pay.

Australia has a proud record in international agricultural research. We've been in it from the earliest days. We do it better than just about anyone else. We've always paid our way, but we've harvested a big return on our investment. Now is the time to renew our commitment. Let us not just put the petrol in the tank; let us keep our hands on the steering wheel, and let us put a foot down hard on the accelerator.

FOOD SECURITY AND THE RISK OF CONFLICT is the transcript of an address given by Dr Pinstrup-Andersen to the National Press Club in Canberra on 29 May 1996.

Food Security and the Risk of Conflict

PER PINSTRUP-ANDERSEN
DIRECTOR GENERAL, INTERNATIONAL FOOD POLICY RESEARCH INSTITUTE

Suppose a 747 loaded with 400 passengers crashed outside Canberra and everyone on board was killed. Now suppose that happened every 15 minutes. Every 24 hours, almost 40 000 people would die. How long do you think it would take the government to act?

Well, that's the number of children who die around the world every day from nutrition-related diseases. And all around the world, governments fail to act. Perhaps that's because most of those children aren't dying in places like Canberra or London or Washington. They are dying in far-off regions of Sub-Saharan Africa and South Asia. The carnage wreaked by poverty and hunger is very often out of sight and out of mind.

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However, the tragedy unfolding in the developing world will affect Australia and other industrialised nations. The widespread food insecurity in developing countries today will threaten global stability tomorrow, and undermine the prosperity of all nations. With that in mind, I would like to explore three matters. Firstly, to point out that agriculture and food play key roles in the development of poor nations and the avoidance of conflict. Secondly, to draw attention to the mutual benefits when richer nations such as Australia invest in the development of poorer nations. Thirdly, to argue that developing-country governments must play a leading role in meeting this challenge and to identify some steps that governments can take.

My central message is this. Business as usual toward developing countries will destabilise the world and threaten the prosperity of even the richest nations. Investing in the development of poorer countries, especially in the all-important area of agriculture, is the best policy for Australia and for humankind. Foreign assistance is an investment, not a handout.

More than half of the developing countries are producing less food per person today than they did 15 years ago. At a time when 800 million people around the world already go to bed hungry, this downturn in per capita food production makes tomorrow look even bleaker. It means less food security in many developing countries and a greater chance of conflict in the very near future.

The highest risk is to be found in Sub-Saharan Africa, and to a lesser extent, in South Asia. If we continue to do business as usual, Sub-Saharan Africa will see rapid increases in hunger and malnutrition, and as I've said, there is a close link between food security and international stability.

What does food have to do with the outbreak of war and other violent conflicts? The media usually see conflicts in developing countries as ethnic or political in origin, often ignited by a specific event or crisis. Indeed, these factors do come into play when conflict breaks out. However, if you look at the root causes of instability, it becomes clear that the single most important factor underlying conflict in the developing world is poverty. From poverty flows a whole host of ills that lead to outbreaks of violence. These include food insecurity, rapid population growth, competition over scarce natural resources, weak economies and weak governments.

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These problems make fertile ground for the seeds of conflict that we see as ethnic, tribal and political strife. When people are fed, healthy, educated and employed, they are infinitely less susceptible to be caught up in conflict, but when they and their children are hungry, sick, ignorant and jobless, when they are without hope, and are lacking in the most basic necessities for a healthy and productive life, then they are certain to be desperate. Human misery sows the seeds of extremism, terrorism and conflict.

Inappropriate use of natural resources is another reason for instability and conflict. As the scarcity of water becomes more severe, failure to use water more efficiently in agriculture and elsewhere will result in more conflict within and across country borders and 'water wars' will become more common.

The importance of food and agriculture goes far beyond the obvious necessity of filling empty stomachs. Agriculture is so important because it represents the lifeblood of the economy in most developing countries. In poor countries, agriculture provides up to three-quarters of all employment and half of all incomes. The majority of the poor depends directly or indirectly on agriculture for their incomes.

IFPRI research shows strong links between the health of the agricultural economy and the economic well-being of developing countries. For each dollar generated in agriculture, another dollar

and a half is generated in other areas of the economy. Helping farmers helps everyone. When farmers are productive, they earn money they can spend on non-farm products produced by their neighbours. The ripple effect begins on the farm and spreads throughout the economy. So agriculture is the hub of economic activity in most developing countries, and as the determinant of prosperity, agriculture is also the key to stability.

Food and agriculture are central to the economy and stability of the developing world. However, I would like to make a case for Australia to invest more in agricultural development. I use the word 'investment' to emphasise that agricultural aid is not a handout. As shown by Derek Tribe and others in recent publications, it is an outlay that produces returns for the investor. For that reason, it is in Australia's best interest to help developing countries help themselves.

...it is in Australia's best interest to help developing countries help themselves.

The ways in which this kind of foreign investment reaps returns for Australia can be identified by the following: first and foremost, alleviating poverty and hunger helps ensure international stability. Stability is absolutely essential to the efficient functioning of the international markets and trade routes that are the lifeblood of the Australian economy. The struggles within poor nations increasingly spill onto the international scene, putting pressure on the United Nations and others to intervene, at enormous expense and loss of life. Recent examples include Somalia, Rwanda and Haiti. In each case, conflict arose from the competition over scarce resources and the desperation fueled by abject poverty and hunger.

The second return for Australia is in the creation of export markets for our goods. As poorer people get richer, they become customers for Australian products. The experience of Asian countries like South Korea, Indonesia, Malaysia, Taiwan and Thailand are examples of this. They have experienced high rates of economic growth because of fundamentally sound development policies and development aid from abroad. Investment in agriculture with emphasis on agricultural research are essential for the economic successes in these countries. Today, these economies provide enormous new export opportunities for industrialised nations like Australia.

The third type of return for Australia's investment dollar is specific to agricultural research. It comes home in the form of new technology for Australian farmers. Farming technology created for use in developing countries returns home to be used by farmers in Australia to increase their productivity.

Farming technology created for use in developing countries returns home to be used by farmers in Australia...

Perhaps the most striking example of this can be found in the high-yielding varieties of wheat developed by one of the CGIAR

centres — CIMMYT in Mexico, which receives support from Australia. These new plants, which grow more food on the same area of land than previous varieties, have been very effective in alleviating hunger in developing countries. Today, these varieties are grown on more than 90 per cent of Australia's wheat area. A recent study estimates the benefits to Australia's wheat sector during the last 20 years to be $2.6 billion. The investment made by Australia in CGIAR as a whole during the same period was US$72 million. Not a bad investment.

The fourth return can be seen in decreased pressure on national borders from international refugees. When desperate people flee their own homes in search of survival, Australia is one place they come. The extent of this pressure will be determined in large part by the number of people who are starving in the region.

As of today, that pressure is growing worldwide. The number of international refugees has increased tenfold during the last 20 years to around 23 million today, along with 26 million refugees displaced within their own countries. This translates to an enormous pool of desperate people who may see little choice for survival but to flee to other lands. Improving conditions in Africa and Asia will stem the flow of refugees to Australia and other parts of the world.

Australians will benefit from agricultural investments in the form of regional stability, more export markets, new technology for Australian farmers, and less pressure on borders.

While many millions of people in developing countries benefit, Australians will benefit from agricultural investments in the form of regional stability, more export markets, new technology for Australian farmers, and less pressure on borders. With all of these benefits to be realised, it makes sense to invest in the well-being of developing nations.

However, developing countries must do most of what is needed. I would like to suggest six areas where action is critical. These six areas were developed as part of a global vision for meeting the world's food needs by the year 2020. They are contained in IFPRI's *A 2020 Vision for Food, Agriculture, and the Environment.*

In order to feed the world and ensure stability in the next century, developing countries must do six things.

- Firstly, strengthen the capacity of developing country governments to do what only governments can do, and leave activities best done by the private sector and civil society. Weak government is a recipe for chaos. The key is to identify those functions that are appropriate for government, and ensure that governments have the resources and the mandate to carry them out.

- Secondly, invest in poor peoples' productivity, health, and nutrition to improve their well-being and generate broad-based economic growth. Poor people without access to resources represent a terrible economic loss to society, and are vulnerable to desperate measures.
- Thirdly, strengthen agricultural research and extension systems in developing countries to help farmers in poor countries grow more food on less land. Agriculture is the single most important sector in most developing countries. Priming the pump of agriculture will send ripple effects throughout the economy.
- Fourthly, help farmers manage natural resources effectively and sustainably. Research and effective policies are needed to stop land degradation and to use water more efficiently. More work should be focused on areas with agricultural potential, fragile soils, and limited rainfall because that is where most of the poor and food-insecure people live, and that is where much degradation of natural resources takes place.
- Fifthly, develop efficient agricultural markets. We need to get seeds, fertilisers and other tools into the hands of poor farmers, and they need to be able to get their goods to market. Investing in roads and other infrastructure is fundamental to the efficient functioning of markets.
- Finally, expand international assistance and improve its effectiveness. We must make prudent investments to realise the greatest impact. We need to see more investment, but we also need to see smarter investment.

Priming the pump of agriculture will send ripple effects throughout the economy.

We need to see more investment, but we also need to see smarter investment.

Investing in the development of poorer countries is a good policy for Australia. Food and agriculture play a key role in developing poor countries and thus reduce the potential for conflict. The assistance of these investments benefit not only the poor people of the world, but also the investor.

These messages must be heard by the governments of the industrialised nations who can and must provide leadership to improve conditions in developing countries. Not doing so is to condemn generations of children to hunger and misery, and to render the world a less safe and prosperous place for all of us.